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With diagrams and maps

NEW YORK
SOUTH MANCHURIA RAILWAY
1922

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PREFACE

This handbook of the resources of Manchuria has been prepared for American readers in response to many requests for accurate and concise information concerning the opportunities for overseas trade and the facilities for travel in this ancient land of the Manchus.

Perhaps nowhere else in the world today is there presented so amazing a transition from primitive agricultural life to twentieth century industry and scientific organization. Manchuria, since the close of the Russo-Japanese War, when the policy of the Open Door was inaugurated, has gone forward with great strides, absorbing Western ideas and developing her rich material resources.

The record of this fifteen-year achievement in colonial enterprise is here set forth in facts and figures, with a careful avoidance of debatable questions of international politics.

In the preparation of this book, the South Manchuria Railway has made use of all available official and authoritative sources of information, and has drawn freely from the "Economic History of Manchuria", published in 1921 by the Bank of Chosen.

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I. GEOGRAPHY, HISTORY AND GOVERNMENT

(1) The Geography of Manchuria

The "Three Eastern Provinces"—Manchuria is situated in the northeastern part of China, and embraces a total area of 365,000 square miles. It comprises the three provinces of Heilungkiang, Kirin and Fengtien. These are called by the Chinese the "Three Eastern Provinces."

Manchuria is separated from Siberia on the north by the Amur River. On the west, Eastern Inner Mongolia touches its borders and stretches, a vast level country, far to the westward. To the east, the Maritime Province of Russia forms the boundary of Manchuria, and southeast of that, Chosen (Korea) is separated from it by the Yalu River. Manchuria on the south is washed by the waters of the Yellow Sea and the Gulf of Pechili.

Climate—Manchuria is included within the parallels of 39° and 53° 30″ north. Between these same parallels lie portions of Spain, France and Italy, but Manchuria has a very different climate than these European countries. It has what is termed a "continental" climate, and is subject to decided extremes of temperature—long, severe winters and hot summers. The average monthly tempera-

ture at Dairen varies from 24° F. in January to 76° F. in August. Further north the winters are much colder and the summer temperatures do not rise quite so high. In Harbin, for example, the average January temperature is around zero, and in July the average is 72° F. The spring season is windy, with the great winds coming across the Mongolian Plains. The rainfall in Manchuria is far less than in Japan. As a whole, the climate is healthful and well adapted to agriculture. Its great plains boast a rich soil, and the 27,000,000 acres now under cultivation produce huge crops of beans, wheat, *kaoliang* (a sort of sorghum), millet and Indian corn.

Topography—The Land of the Manchus is traversed north and south by two large mountain ranges and fertile valleys lie between them. A low ridge in the center of the country forms a natural division for the water courses running north and south.

The mountains are rich in timber and minerals, especially coal, and the rivers are navigable for hundreds of miles and served as travel routes before the building of railways.

The largest of these rivers are the Amur, the Sungari and the Ussuri in the north, and the Tumen, the Yalu and the Liao in the south. The valleys of these rivers are fertile and highly suited to cultivation.

The eastern part of Inner Mongolia resembles Northern Manchuria in parts, but contains also great steppes, plains and deserts—uncultivated windy spaces inhabited by nomad tribes.

Population—The population of the "Three Eastern Provinces" and the eastern part of Mongolia at the present time can only be roughly estimated. An accurate census of these districts has never been taken. Approxi-

mately, however, the latest population count reached in the neighborhood of 25,000,000 people.

Manchuria is inhabited by Manchus, Chinese and in the Kwangtung Peninsula by Japanese. Mongolia is inhabited chiefly by Mongolian tribes with a large sprinkling of Chinese, who are all near the border of Manchuria. Besides these, there are some 600,000 Koreans in Mongolia, and more than 100,000 Russians. The average population per square mile in Manchuria is 53 people, or about the same as the state of Missouri, and considerably greater than that of the United States as a whole, which is now 35 to the square mile. In Fengtien Province there are 129 inhabitants to the square mile, about the same as in Ireland. The density of population of Manchuria and Mongolia, as these figures show, is much greater than has been generally believed. The population of Manchuria is increasing rapidly. Those already established in the country feel it more than ever their homeland since a great railway system has brought modern enterprise, education and civilization into the provinces. Every spring from 350,000 to 450,000 coolies migrate from Shantung to work on the Manchurian farms, and on the railway, and after the harvest 220,000 to 330,000 return to their homes. The others stay in Manchuria and find permanent employment.

(2) A Short Chapter of History

Legendary history—The beginning of Manchurian history is lost in antiquity; and much of the early history of this vast district is an uncertain legend. Manchuria and Eastern Inner Mongolia were given up to savage tribes, and the rivalries between them resulting in a constant, unorganized warfare was all the story that these wild regions boasted.

At one time it appears that the Koreans spread over the country in great numbers, but the Mongol and Tungus tribes were the most powerful and persisted the longest. Between the 10th and 11th centuries Manchuria was the theatre of active warfare. Rival dynasties were attempting to rule the country, and hostilities were carried on also with the Sung Dynasty, then reigning in China proper.

Genghis-Khan, the Conqueror—In 1260, however, Manchuria takes its place in history, with a thrilling chapter. Genghis-Khan, the great Asiatic prototype of Alexander the Great, dreaming his dream of a world empire, absorbed Manchuria in the great conquests that he made. Under his successors, Manchuria became a part of the Chinese empire and the Mongols rose steadily in power. They at length established a Mongol Dynasty to rule over China. In 1644 the first Manchurian Emperor of China removed his capital from Mukden to Peking, and caused the larger portion of his race to leave their old home and reside in China. Manchuria became the "Forbidden Country" and the government allowed nobody to enter, save those sent from China to gather wild ginseng or falcon feathers. This prohibition lasted for about a century, when the law was relaxed and a large Chinese immigration resulted. At the present time ninety per cent of the native inhabitants of Manchuria are Chinese. The rest are descendants of the original Manchus and Tungus tribes.

The ascendency of the Russians—The Manchu Dynasty, existing from 1644 to 1912, was the last to reign in China. From the 17th century military clashes occurred between the Russians in Siberia, north of the Amur River, and their Oriental neighbors to the south. In the 19th

Nippon Bridge spanning the South Manchuria Railway, Dairen

The Dragon Fountain Temple, situated in a little valley among the famous "Thousand Ridges" of Manchuria.

century Russia acquired the Maritime Provinces and the Port of Vladivostok, which gave her access to the Pacific Ocean. From that time on her policy steadily gained a foothold in the Far East. The Treaty of Shimonoseki between China and Japan offered Russia the opportunity of securing the railway concession in North Manchuria. The Kwantung Province was leased to Russia for a period of twenty-five years, together with the railway concession in South Manchuria.

The Russo-Japanese War—Admiral Aleksyeev was appointed by the Czar as Russian Governor General in the Far East, and he took up civil and military rule from the fortified port of Port Arthur on the Yellow Sea. With the advantage of such a fortified port, military control of a great region, a great railway, an outlet through another port at the north, and railway connections across Asia straight into St. Petersburg, the Russians proceeded to make war with Japan.

The Russo-Japanese War, 1904-1905, was fought chiefly in South Manchuria, and the struggle was one of the fiercest and greatest up to that period of the world's history. The siege of Port Arthur and its stubborn defense need no mention here. The whole world knows the story. The Battle of Mukden also has its place in history, and connected with that battle is the splendid account of how the Japanese protected from dishonor the tombs of the Manchu Emperors at Mukden. This one act of the Japanese appealed strongly to the Chinese with their rigid ideas regarding respect for the dead, and had much to do with the friendly Chinese feeling extended to Japan at the close of the war.

The coming of the Japanese—The war was terminated by the Treaty of Portsmouth, signed at Portsmouth, New

Hampshire, in 1905. That treaty gave into the possession of the victorious Japanese, subject to agreement with China, the Kwantung Territory and the southern portion of the Manchurian Railway, from Changchun to Dairen and Port Arthur, and all the property pertaining thereto, including extensive, partially developed mines. In 1906 the South Manchuria Railway Company was organized to develop and maintain the South Manchuria Railway and to supervise the Railway Zone. A treaty, concluded May, 1915, between Japan and China extended the lease of the Kwantung Leased Territory and the South Manchuria Railway Lines to 99 years.

A railway that brought prosperity and civilization—It will be plain that, without bias, it may be stated that a great developing influence has been brought into South Manchuria and the adjacent provinces by the railroad. The progress that has taken place since the railway has been under the control of the Japanese has been phenomenal. The once "Forbidden Land" has been opened not only to the world at large, but, more particularly, to the Chinese themselves, who never dreamed that such golden opportunities lay at their very doors. Less than a generation ago the Russians opened up portions of the country, but it has been the Japanese who have made it a land of opportunity for the world.

New towns, built by the Japanese, have sprung up along the railway—not mushroom towns, but cities, planned and built after the best Western models, with spacious streets and boulevards, parks, hotels, clubs, schools, hospitals and markets. Today, strange as it may seem, the traveler in these old Manchu provinces of China finds express trains with luxurious dining and sleeping appointments, towns with palatial hotels and

Continental service, travel bureaus and clubs where he is made welcome — Occidental civilization transplanted overnight in an Oriental setting.

(3) The Government of Manchuria

Chinese governmental offices—The three provinces of Manchuria (Fengtien, Kirin and Heilungkiang) are subdivided into minor districts or *tao* and prefectures. The *tao* are administered by *taoyin* or superintendents, and the prefectures by prefects. Each province has a *tuchun,* or military commander, who, being nominally the Civil Governor, is credited with the real political power.

At Peking there is a Ministry of Agriculture and Commerce which looks after, or was designed to look after, all of the industrial institutions in China. This ministry normally embraces four bureaus: Agriculture and Forestry; Industry and Commerce; Mining; Fisheries and Stock-farming. However, the administration of such bureaus, insofar as it reaches into the distant provinces, is, under the disturbed conditions prevailing throughout China, a matter more of name than action. The Chinese Provincial Governments of Manchuria have the execution of all laws and administration in their hands.

The Chinese Provincial Governments of Manchuria, situated at Mukden, Kirin and Tsitsihar, and also the Military Governments of Inner Eastern Mongolia each has a Board of Industry under the direction of the Provincial Governments which attends to all questions of industry in those districts. In fact, Chinese administration is organized along the usual lines employed in other countries, but, owing to the political disturbances surrounding the central Chinese Government at Peking today, the

carrying out of provincial administration of the three eastern provinces of Manchuria and Mongolia lies almost entirely under the control of the Governor General.

The present Governor General of Manchuria, Governor General Chang Tso Lin, has his headquarters at Mukden. General Chang Tso Lin is a man of great personal force and ambition. He has given much support to the methods of modern living, sanitation, education and industry which have been brought into the country by the Japanese. Many of these methods have been adopted by the Governor General and used in his own administration of the Chinese provinces. The present Governor General exerts a most powerful influence throughout the three eastern provinces.

There is also in Manchuria a Forestry Office at Harbin and a Mining Inspector's Office at Changchun. Presumably under the direction of Peking, these offices, however, are controlled by the Governor General of Manchuria, and all important negotiations regarding the affairs directed by these offices are carried on at the Governor General's Yamen in Mukden.

Japanese jurisdiction in Manchuria—The Japanese jurisdiction in Manchuria is limited to 1,300 square miles, known as the Leased Territory in the Kwantung Peninsula, and the South Manchuria Railway Zone of 100 square miles. This Japanese jurisdiction is confined to civil administration in the Leased Territory, and to railway guard, police and postal service in the Zone. For the benefit of the people within the boundaries of these two districts, there has been also instituted an Industrial Department. The Kwantung or Japanese Government pursues a policy of investigation, experiment and encour-

agement resulting in extensive agricultural, stock farming, forestry and industrial enterprises.

The Leased Territory is divided for local government purposes into three civil administration districts with headquarters at Dairen, Port Arthur and Chinchow. Port Arthur and Dairen are partly self-governed, having been raised to municipalities electing their mayors and counsellors, among whom, at Dairen, there are many prominent Chinese.

The Leased Territory is a "free zone" and consequently no duty is levied on goods imported for consumption within it; but articles passing the frontier into Manchuria are subject to the Chinese tariffs. The entire system for the administration of the customs is in the hands of the Chinese. They maintain forty-seven regular custom offices in China, and eleven in Manchuria. The Manchuria custom offices are situated as follows: North Manchuria—Aigun, Sansin, Manchuli, Harbin, Pogranchinaya, Hunchun, Lungchingstun; South Manchuria—Antung, Tatungkow, Dairen, Yingkou. Various customs sub-stations for the South Manchuria Railway are located at Port Arthur, Chinchow, Pulantien and Pitzuwo.

The railway civic administration—The South Manchuria Railway, having under its charter assumed the responsibility of taking care of the public health and the civil engineering enterprises throughout the railway zone, at first sought the aid of various local organizations to handle the matters of public works. The company was also invested with authority to receive rates from the inhabitants of the zone for the purpose of assisting in the carrying out of beneficial projects such as the upkeep and improvement of public utilities, schools, hospitals, etc. To this end the rules that were to cover the regulations

for receiving public monies were formulated in a large measure by the residents themselves.

In 1907 when the company took over the management of the Railway Area there were "settlement councils" at various centers along the railway. The company thought it expedient to utilize them to act as its agents in the matter of rates and fees and other necessary assessments, but this experiment was not as successful as the company had hoped it would be. In the same year, therefore, the company established district agencies of its own at Liaoyang, Mukden, Changchun and four other places. Today there are eleven of these district agencies as follows: Wafangtien, Tashihchiao, Liaoyang, Mukden, Tiehling, Kaiyuan, Ssupingkai, Kungchuling, Changchun, Penhsihu and Antung. At Shakakou the railroad workshops perform the duties of district agencies, and at Fushun the general offices of the collieries do a similar service. Where there is no district agency, the railroad station master is charged to assume part of the duties of district agent.

According to the conditions and regulations concerning the rates and fees in the railroad area, the outlay for improvements of public utilities within the area is borne by the company, while the current expenses in connection with maintenance, etc., are paid out of the monies assessed upon and received from the residents, the company making good any deficit. The rate of all fees is regulated by a system of scale assessment determined largely by the financial status of the town and the residents. Under this plan the work has greatly progressed. The railway company, up to 1920, had invested in city building and civil engineering works, $4,395,000; in hospitals, schools and other public works, $3,775,000; in building and dwelling houses, $3,070,000; a total of more than $11,000,000.

There are other places besides Dairen and Port Arthur

which assume the standing of modern cities. Mukden, the junction city of the South Manchuria Railway main line, the Antung-Mukden line and the Peking-Mukden line; Changchun, the junction point of the South Manchuria main line, the Chinese Eastern line and the Kirin-Changchun line; Ssupingkai, the junction of Ssupingkai-Taonan line and the South Manchuria Railway line; Fushun, the coal city; Anshan, the steel city; Wafangtien, Tashihchiao, Liaoyang, Tiehling, Kaiyuan, Kungchuling, Ssupingkai, Antung and Penhsihu are all in this group of well managed, flourishing cities.

As the native Chinese usually live in unsanitary houses, the company has built many dwellings of modern type and has leased them mostly to the employed natives to better their living conditions.

The "Commercial Handbook of China," published by the Department of Commerce, Washington (1920), gives the following summary of Manchuria:

Area—365,000 square miles.

Population—15,000,000; 40 per square mile; densest in Liao Plain.

Topography—Three provinces, Fengtien, Kirin, and Heilungkiang; northern region larger and better wooded, sloping toward Gulf of Liaotung; Sungari plain in north and Liao plain in south have wonderful soil and splendid crops; large areas still uncultivated; on rich plateau lands, grass sometimes grows 6 feet high; climate is healthful, though winters are very severe.

Agriculture—Manchuria contains some of the finest agricultural land in the world. It seems strange that this virgin country, so sparsely inhabited and so rich in possibilities, should have remained all these centuries in proximity to densely populated countries and not have been more effectively colonized ere this. The principal crop of Manchuria now is beans, an article whose value has only recently come to be appreciated by the outside world. Wheat ranks second in importance. Other cereals, such as millet, sorghum and maize are raised in large quantities. Silk, fed on oak leaves, is one of the products of Manchuria. Tobacco, beet sugar, indigo, vegetable oils, fruits and live stock add to Manchuria's agricultural wealth.

Minerals—Practically the whole of South Manchuria is one vast coal field. Iron and gold are also found. Japanese capital is developing the coal and iron properties in a large way.

Industries—Bean oil, bean cake and bean products generally constitute a great industry in Manchuria. Raw silk, tobacco, flour, furs and skins, lumber, and iron and coal are developing into profitable industries, employing in some cases enormous capital. The South Manchuria Railway, with its ramifications of industry, is the biggest institution in Manchuria.

Communications—Waterways: the Amur River is navigable for 450 miles for steamers and 1,500 miles for smaller craft; the Sungari is navigable to Kirin, the Nonni to Tsitsihar, the Liao to Tungkiangtze, and the Yalu for its entire course. Railways: Mukden is connected on the south with Tientsin and Peking, on the north with Harbin and Tsitsihar, on the southeast with Port Arthur and Dairen, and on the east with Antung; through rail service from Peking to Yokohama, via Manchuria and Korea, is established, and also in peace times from Peking to Petrograd via Manchuria. Country roads are relatively good, and travel is by carts or on mules. Post offices, 203. Telegraph stations, 132.

Cities—Mukden and Kirin, 100,000 each. Kwangchengtze (Changchun), Harbin, Aigun, Newchwang (Yingkou) and Dairen are other important cities.

Treaty ports—Aigun, Antung, Dairen (Japanese leased territory), Manchouli, Newchwang, Sansing, Suifenho, Mukden, Fakumen, Fenghwangcheng, Hsinmintum, Tiehling, Tungkiangtze, Liaoyang, Changchun, Kirin, Ninguta, Chientao, Tsitsihar, Hailar.

Language of natives—Northern Mandarin is most common.

American interests—In north, under jurisdiction of Harbin consulate; in northeast, of Antung consulate; in Dairen and Leased Territory, of Dairen consulate; in South Manchuria, of Mukden consulate general.

II. NATURAL RESOURCES OF MANCHURIA

(1) Agriculture

The Garden of China—"Manchuria," says the Encyclopedia Americana (1921), "has one of the richest soils in the world, and, with the development of the soya bean industry, has grown more rapidly than any other Chinese province. In the summer the southern part looks to an American much like Illinois, and one may find on its northern hills lilies-of-the-valley, pink peonies, white and yellow daisies and the fragile dog roses, as in Wisconsin and Minnesota. With the exception of the four ice-locked months its fields are luxuriant with wheat, barley and millet, so that its has come to be called the 'Garden of China'."

The "Economic History of Manchuria," published in 1921 by the Bank of Chosen (an interesting and valuable contribution to the growing literature of Manchuria) states:

"Manchuria is yet the most favored spot for agriculture in the Far East, and its opportunities may well be termed 'immense'. That great mass of level land, extending over the whole of Central Manchuria and comprising the basins of the Liao, Sungari, Nonni and Hulan, the productiveness of which can compare favorably with any part of Japan or Korea, is by itself as large as the whole

of the Chinese Peninsula* or of the mainland of Japan, and, to those who know how little of level land there is in these two countries that is really arable and actually under cultivation, it will not be at all difficult to imagine the wonder in which the two peoples look upon this apparently boundless extension of rich field. An American gentleman with whom the author had the honor of traveling in Manchuria ejaculated, as the train was drawing near to Mukden, 'This is exactly what we see in America', as though relieved at seeing something homelike after a long journey through apparently endless chains of rugged mountains in Japan and Chosen."

Area under cultivation—The aggregate area under cultivation in Manchuria and Eastern Inner Mongolia is 33,585,000 acres, distributed as follows:

Fengtien Province	11,392,500 acres
Kirin Province	7,847,500 acres
Heilungkiang Province	7,935,000 acres
Eastern Inner Mongolia	6,410,000 acres

The arable land awaiting development is estimated at 42,500,000 acres, an area equal to the improved farm land in the states of Indiana and Illinois. The land being reclaimed is estimated at about a million acres a year.

Railways stimulating agricultural production—Until quite recently the crops were transported through inadequate waterways and by primitive Manchurian carts, but the establishment of railways and the highly efficient port of Dairen has made a radical improvement in transportation methods. The Chinese Eastern Railway, the South Manchuria Railway, and the Peking-Mukden Line of the Chinese Government Railways are now carrying annually large numbers of immigrants and great stocks of agricultural produce.

*Chosen (Korea)

Methods of cultivation—Agricultural methods in many parts of Asia have changed little in centuries. But in Manchuria a great change has taken place since the South Manchuria Railway inaugurated its program of economic development work. Modern methods are taught the native farmers; the fertility of the soil has been increased; the yield and quality of the great staple crops have been improved; and new plants and trees have been introduced.

For this reorganization of Manchurian farming, the Agricultural Experiment Stations instituted by the railway are primarily responsible. These stations are operated like those in the United States, and seek to bring to Manchuria the latest world knowledge of scientific agriculture.

At Kungchuling (in the heart of Manchuria, 400 miles north of Darien) is the main experiment station. Here are being carried on important experiments in animal breeding. Merinos from the United States have been bred with the native sheep, increasing the quality and yield of wool, and thus giving great impetus to the export trade. Berkshire hogs have been imported for breeding to improve the native stock.

Much has been done to increase the oil content of Manchuria's chief product, the soya bean, and better cultural methods have been taught the farmer.

The arboriculture work at the Hsiungyocheng experiment station has been productive of most important results in reforestation and afforestation. Much of this country was barren of trees. But now big orchards dot the southern part of Manchuria; American apples and grapes have been successfully introduced, and the fragrant perfume of the acacia fills the air. In northern Manchuria there have

been planted many willows and Chinese poplars, from the wood of which match stems and pulp are made.

Experiments are going forward at Hsiungyocheng for the improvement of the cultivation of the *tussah,* or wild silk, one of the principal exports.

Agricultural products—The chief agricultural products of Manchuria are soya beans, *kaoliang* (a sort of sorghum), millet, maize and wheat.

The output of the leading crops in 1920 in tons was as follows:

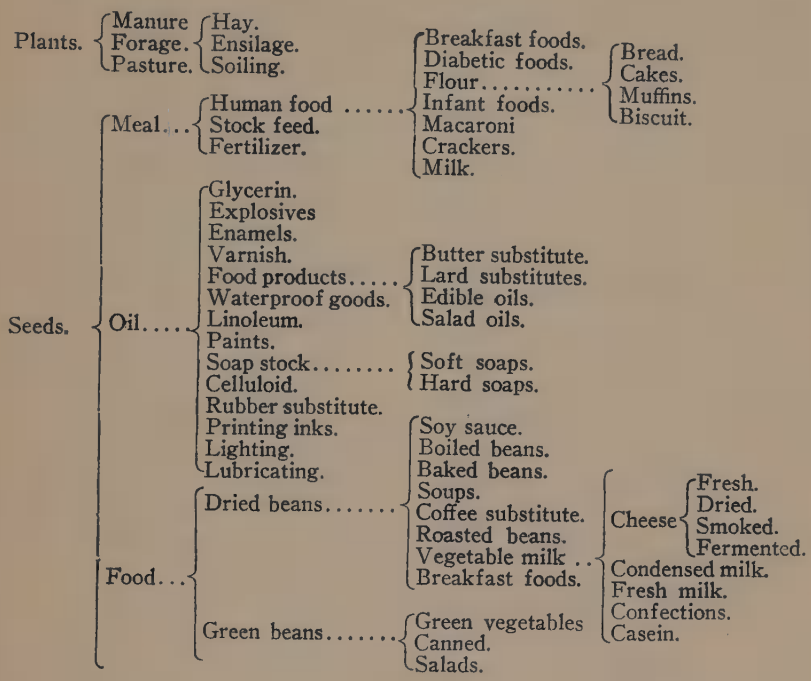
	Kaoliang	Millet	Soya Beans	Corn	Barley	Wheat	Small Beans
Kwantung Territory ...	16,000	17,900	15,500	60,000	1,800	1,100	4,200
Fengtien Province ...	3,340,000	1,853,000	1,762,000	1,033,000	58,000	143,000	132,000
Kirin Province	2,148,000	1,929,000	1,135,000	428,000	1,223,000	368,000	116,000
Heilungkiang Province.	678,000	893,000	551,000	154,000	178,000	515,000	52,000
Eastern Inner Mongolia	551,000	436,000	326,000	49,000	75,000	66,000	57,000
Total	6,733,000	5,128,900	3,789,500	1,724,000	1,552,000	1,093,100	361,200

Soya beans—The United States Department of Agriculture, in a recent report, made this statement: "The rapid rise of the soya bean to a crop of special importance in the world's commerce in the past few years is one of the most remarkable agricultural developments of recent times."

The soya bean has been an important food in China for 5,000 years, but it is only during the past few years that America and Europe have learned of the great utility of this prime staple of the soil of Manchuria. The Japanese firm of Mitsui & Company made the first shipments abroad in 1908, when an initial shipment of a hundred tons was made to England. Huge quantities of soya bean oil were imported into the United States during the World War to supply essential raw materials.

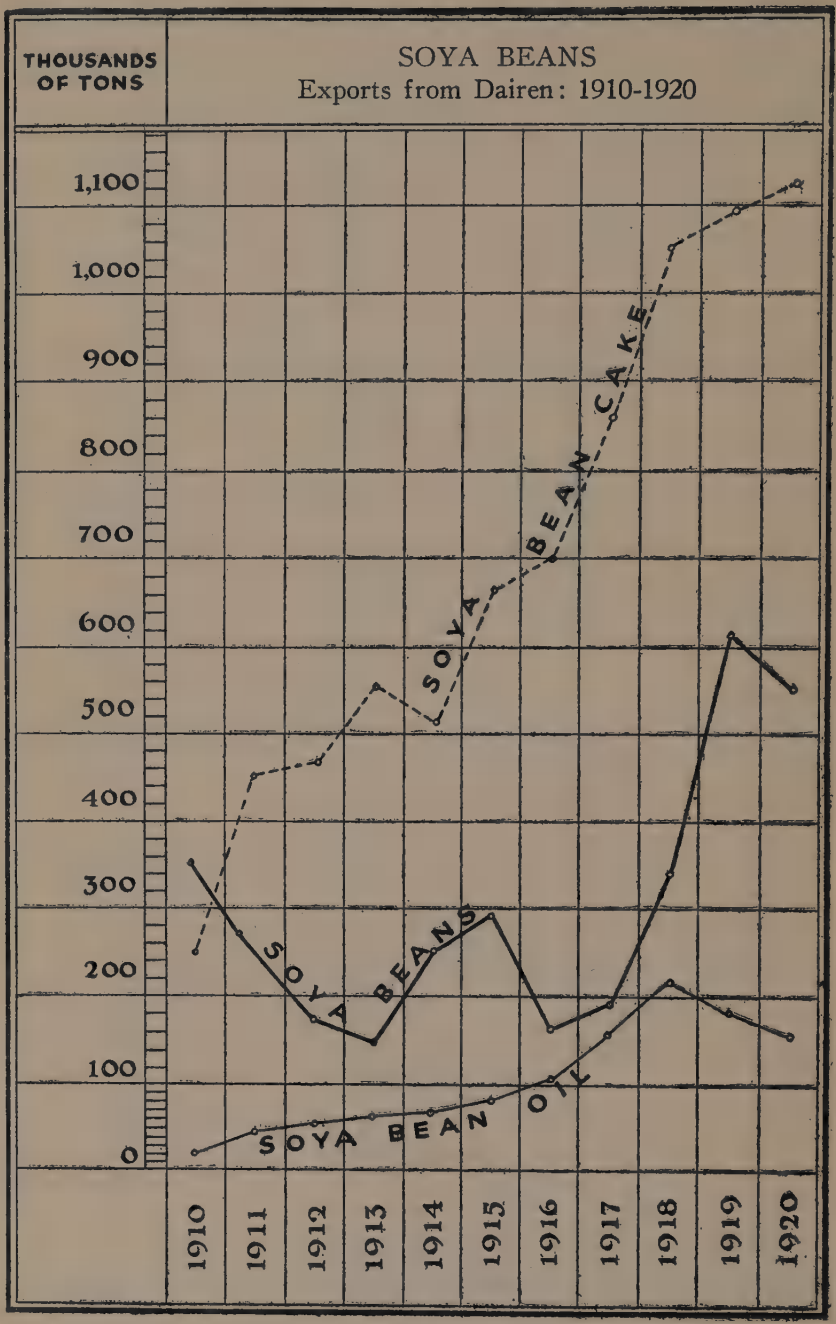
With its very high content of protein (40%), the soya bean has been characterized as a "modern manna."

Among its many uses the Department of Agriculture lists these:



The development of a world market for Manchuria's chief product has resulted from the activities of the South Manchuria Railway in improving the quality of the soya bean and exploiting new uses for it through its agricultural research laboratories, and in systematizing the transportation and merchandizing of the crop. The growth of the industry has provided employment for hundreds of thousands of Chinese, who have been attracted to Manchuria from the neighboring provinces, chiefly from Shantung.

From the busy port of Dairen, the gateway to Manchuria and the southern terminus of the railway, merchant ships of many nations now carry great cargoes of


THOUSANDS OF TONS
SOYA BEANS
Exports from Dairen: 1910-1920
1,100
1,000
900
800
700
600
500
400
300
200
100
0
SOYA BEAN CAKE
SOYA BEANS
SOYA BEAN OIL
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920

soya beans and bean oil to the United States, England, France, Sweden, Holland, Denmark and Egypt, as well as to neighboring countries. Beans are exported mostly to China and Japan, bean cake to Japan, and bean oil mostly to Europe and America.

In South Manchuria there are nearly 200 large bean mills, using various methods of oil expression, from the primitive hand press to motor power. A new process to extract oil by means of chemical action was adopted at a new experimental bean mill built by the South Manchuria Railway in 1915, and, in pursuance of the company's policy, when the superiority of the process had been established, it was turned over to private management to develop commercially. Another development in the bean-oil industry is also due to an invention made at the company's laboratory for the hardening of bean oil and the manufacture of stearin, olein, glycerine, etc., which led to the establishment of a private company for its special exploitation.

Soya beans of Manchuria are divided into four classes, according to color—yellow, white eyebrow, green and black. The chemical composition of soya beans, according to analyses made in the Dairen Central Laboratory, is as follows (the figures showing percentages):

	Moisture %	Albumi-noids %	Fat %	Carbo-hydrates %	Fibre %	Ash %
Yellow Bean.....	9.11	39.90	17.59	24.27	4.92	4.21
White Eyebrow ..	12.34	37.35	17.37	23.36	5.12	4.36
Green Bean	12.64	36.47	16.23	25.08	4.89	4.69
Black Bean	10.74	35.32	15.80	24.43	5.96	4.00

Kaoliang (*a sort of sorghum*)—The staple food of the native population is *kaoliang,* and it is also the principal grain food of the numerous animals engaged in farm-work and the carrying trade of the three provinces.

Before soya beans attained their present importance, half the total area of the cultivated land in Manchuria was devoted to *kaoliang,* and a large amount of it was exported to other provinces of China. Recently the cultivation of *kaoliang* has given place to that of beans in many places. In South Manchuria 26.6% of the cultivated area is devoted to *kaoliang,* 20% to beans, 16.1% to millet, 25.6% to corn, 2.5% to wheat and 9.2% to other crops. In North Manchuria a larger percentage of the area is devoted to millet, *kaoliang* and wheat, and less to corn.

The annual production of *kaoliang* in Manchuria is estimated at about 180,000,000 bushels. It is not only used as a foodstuff for man and beast, but the native spirit is also made out of it. Nor are the grains the only useful part of it; the stalks play a very important role. The outer leaf layers are woven into mats, so much required in the trade of the country, for roofing ricks and packing loads of grain and beans, and for numerous other purposes. The stalks are also utilized for fencing, bridging and housebuilding, and where wood and coal are unobtainable or dear the stalks are used for fuel and pulp. *Kaoliang* spirit, extensively used in both Manchuria and Mongolia, is colorless and transparent, and possesses a strong flavor, which peculiarly appeals to the taste of the natives.

Millet—As the staple food of the native population millet is next only to *kaoliang,* and in North Manchuria, where *kaoliang* does not prosper, it is the main food of the inhabitants. It is also important as material for distilling native spirit, *huangchu* (yellow drink), while its straw is universally used for fodder. Millet is cultivated throughout Manchuria, but more largely in the north than in the south. The annual production is about 150,-

000,000 bushels. Its importance as an article of trade is growing.

Maize—Maize or Indian corn is grown in Manchuria in the same way as *kaoliang*. It is divided into three kinds —yellow, red and a native breed called *laolaichou*. It is grown in the southern part of South Manchuria and also in a part of North Manchuria, and also forms an important article of food. In North Manchuria, an intoxicant is brewed from it. The stalks are used as an article of fuel while the leaves are good for fodder. The crop is about 50,000,000 bushels.

Wheat—North Manchuria is an ideal wheat field, and wheat is there grown in considerable quantities. The best wheat fields are found around Ningan, Petuna and Harbin, along the right bank of the Sungari, and in the country around Suiwha. In South Manchuria wheat fields are mostly found around Hsifeng and Hailung, and the country lying to the west of the Liao, while Tiehling has one of the largest flour-mills in Manchuria. Wheat has been cultivated in South Manchuria from very early times, but only very recently has the production been sufficient to encourage export. Manchurian wheat is now beginning to take its place in world trade. In 1920 through the port of Dairen 342,550 tons were exported to Europe, and in 1921 the exports were 165,300 tons.

Barley—The cultivation of barley in large quantities dates from the Russo-Japanese War, when the demand for it was called forth by the Japanese army in Manchuria as the grain food for horses. It is now cultivated in considerable quantities around Changchun, Kungchuling, Liaoyang and Haicheng. It is used by the natives as food and as feed for their animals. It is also used as a ferment in the distillation of native spirit. Its annual production is estimated at 30,000,000 bushels.

Buckwheat—Buckwheat is an autumn crop which requires only two and a half months to ripen, being sown in July and harvested in September. It is often sown after wheat, or takes the place of other crops when these fail on account of drought or excessive rainfall, so that one harvest at least may be obtained from the soil. It is ground into flour and made into a kind of macaroni, baked into cakes, or boiled to make gruel.

Rice—Rice in Manchuria is not cultivated in paddy fields, but it is grown on dry land like other cereals. The production has never been very large, for the Chinese in Manchuria do not care much for it, and do not use it except on rare occasions, such as big dinners and festivals. The annual production of upland rice is 6,000,000 bushels, and water-field rice 900,000. The demand is now fast growing owing to the entry of the Japanese into Manchuria, and, just as the Russian entry into the north stimulated the cultivation of wheat, that of the Japanese in the south is encouraging rice cultivation there. The cultivation of water-field rice was first undertaken by the Korean immigrants, then it was followed by the Chinese, and today many Japanese are engaged in the cultivation of it along the railway lines.

Hemp and jute—Hemp is grown in Fengtien and Kirin Provinces, the total production being 21,000,000 pounds a year, about three-quarters of which is grown in South Manchuria. Jute is grown along the Liao, Nonni, Sungari and Tumen Rivers. The annual production is 31,000,000 pounds, about three-quarters of which is produced in North Manchuria. A large part of the hemp and jute is consumed where it is grown. The amount of hemp coming into the market is now about 3,000,000 pounds a year, and of jute 6,500,000 pounds. Hemp

plants cultivated for seed are not as a rule utilized for fibre, or, if they are, the yield is of a very poor quality. It is chiefly in South Manchuria that hemp and jute are grown for fibre. These are differently cultivated. Some are cultivated for the double purpose of seed and fibre. The best hemp, white and tenacious, is produced around Hailung and Hsifeng in Fengtien Province, and is generally woven into cloth, while the next quality is produced around Pinhsien and Ningan in Kirin Province, and is generally made into thread. A more ordinary quality is mostly made into nets and ropes, and the poorest is used for paper-making. Jute is less flexible than hemp, but because of its waterproof nature is used in the making of bags, ropes, nets and string, and various shipping and fishing tackles. In 1916 a company was formed in Dairen to manufacture hemp bags, using Manchurian hemp and Indian jute.

Tobacco—Tobacco is one of the staple products of Manchuria. The best leaf is raised around Kirin. It is blended with foreign leaf in making cigarettes. The British American Tobacco Company has a factory at Mukden, and the East Asia Tobacco Company has a factory at Yingkou. The export of the native leaf is increasing.

Cotton—Cotton is grown only in the region lying to the south of a line drawn between Tiehling and Kangping. Cotton in Manchuria was originally cultivated on a very small scale by the farmer for the use of his own household, and it was only around Liaoyang and Chinhsien that cotton was brought to the market as an article of trade.

Wild silk—The cultivation of wild silk was begun in China 1800 years ago and introduced into Manchuria by immigrants from Shantung Province about a century ago.

The industry developed year by year, taking into the silk region district after district, until it now comprises the whole country, including in the south the Leased Territory of Kwantung and in the north the towns of Kaiyuan, Changtu, Hailung, Tunghwa, etc., in short, nearly all South Manchuria. The following table shows the approximate number of farms in the principal districts:

Country around	Number of farms	Country around	Number of farms
Liaoyang	170	Kwantien	2,527
Fuhsien	1,143	Kaiping	5,357
Antung	1,575	Fenghwang	663
Haicheng	561	Huanjen	51
Hsiuyen	770		

The quantity of wild silk cocoons produced each year is between six and seven billions.

Sugar beets—The soil is adapted to the sugar beet, and especially around Mukden are large tracts under cultivation for the South Manchuria Sugar Refining Company. The development of the beet sugar industry has been stimulated by experiments conducted at the Agricultural Experiment Station since 1914. The average percentage of sugar in beets is 15.34%.

Other crops—Manchuria has great possibilities as a fruit-growing country, and it is quite possible that it may develop into a great wine-producing region, owing to its natural fitness for the cultivation of the vine. In the belt from Kwantung north to Mukden, the orchard industry is being developed. Superior species of apples, pears, grapes, etc., are now being grown.

Manchurian farms also produce potatoes, oats, red and kidney beans, etc.

Stock-raising—Before the immigration of the Chinese from the south, the chief occupation of the original Man-

chus was the raising of stock. With the entry of the Chinese, the rich pastoral grounds which then covered the greater part of the country were converted one after the other into grain fields. Thus agriculture rose, but stock-farming waned. A shadow of the old pastoral age is still visible on the Mongolian frontier and in the western part of Heilungkiang Province, where the inhabitants are still devoted to the breeding of cattle. Besides, the Manchurian farmers generally keep large numbers of horses, mules, donkeys, oxen and pigs. The Chinese have always been more skillful in using domestic animals on the farm. Five or six head of cattle, horses, mules or donkeys are often hitched at random to a heavily loaded cart, and this motley team is managed with admirable dexterity by a Chinese driver. Sheep are very plentiful, especially in Mongolia, where the inhabitants depend largely upon sheep for meat, milk and cheese. Dogs are also to be found in great number throughout the countryside, as they are essential to the farmers for protection against bandits. Nearly every cottage has two or three dogs, and the larger farms have a dozen or more.

The number of domestic animals in the different provinces is estimated at 23,300,000, of which 8,700,000 are fowl. The distribution of these animals is as follows:

	Fengtien	Kirin	Heilungkiang	Eastern Inner Mongolia	Total
Horses	750,000	500,000	510,000	810,000	2,570,000
Mules	200,000	230,000	120,000	70,000	620,000
Donkeys	330,000	120,000	70,000	100,000	620,000
Cattle	580,000	90,000	210,000	1,120,000	2,000,000
Sheep and goats	400,000	100,000	60,000	2,000,000	2,560,000
Camels	.....	.....	.....	4,000	4,000
Pigs	3,550,000	1,250,000	490,000	1,000,000	6,290,000
Total	5,810,000	2,290,000	1,460,000	5,104,000	14,664,000

The horses are all of Mongolian breeds, rather undersized, and with great endurance. Mules, unknown in Japan, have long been bred in China. They command

higher prices than the horses. The donkeys are used in farming and transport.

The cattle are of Korean, Shantung, Manchurian and Mongolian breeds. The Chinese keep cattle to work them, and the Mongolians for the milk they yield, the beef being regarded as a by-product. The cattle in South Manchuria and Inner Mongolia have not been properly bred, and there is a great opportunity for improving the different breeds by the mixture of foreign stock. The same is true of sheep and pigs. The native sheep give not more than three pounds of wool. With the recent development of the woolen industry in Japan, both wool and goat's hair have been exported in considerable quantities. In South Manchuria goat-raising takes the place of sheep-raising among the Chinese. Pig's hair is exported for brush bristles. The South Manchuria Railway Company, through its agricultural experiment stations, is importing American and British stock, and the day will come when Manchuria will be one of the finest grazing countries of the world. Breeding the native sheep with Merinos has increased the output of wool of two-year-old mixed sheep from 3.4 to 6.2 pounds. The second breeding with Merinos trebled the output of wool. Bred with Southdown sheep, the output of wool was increased to 4.5 pounds and with Shropshire to 5.9 pounds.

The export trade in animals and animal products is bound to grow rapidly as modern breeding methods are introduced. The exports of these products from Manchuria in 1920 were:

	Taels
Domestic animals, including cattle, horses, mules, pigs, sheep, etc.	464,154
Wool, goats' hair, etc.	293,442
Bristle and horse hair	273,349
Leather and hides and manufactures	983,866

Eggs	591,446
Animal oils	113,973
Animal's bones	166,311

(2) Forestry

Distribution of forests—In South Manchuria, the foot of the Changpai Mountains, along the upper reaches of the Sungari, the Mutan and the Tumen, and also the upper parts of the Yalu and the Hun are densely wooded; while in North Manchuria, the districts about Hailin on the Eastern Section (between Harbin and Pogranichnaya) of the Chinese Eastern Railway and about Sansing in Kirin Province are the principal forest lands. Mongolia is a vast plain consisting of level land grown with grass and dotted with dunes. Nothing like a forest can be seen.

The forest areas are estimated as follows:

a. On the right bank of the Yalu and along the Hun River; 1,600,000 acres with 6,900,000,000 cubic feet of timber.

b. On the upper parts of the Sungari, the Mutan and the Tumen; 4,800,000 acres with 26,000,000,000 cubic feet of timber.

c. Along the Eastern Section (between Harbin and Pogranichnaya); 6,000,000 acres with 18,500,000,000 cubic feet of timber.

d. About Sansing district; 13,000,000 acres with 52,000,000,000 cubic feet.

e. As to the forests in and about the Hingan Range, no data can be obtained, except that in the districts within a radius of about 30 miles around Horgo and Hingan Stations, the average timber asset is put at about 1,300 cubic feet to the acre.

Forest conservation—Manchuria needs afforesting in many places. Hills and mountains now bare and barren but capable of being converted into fine forests for the benefit of the people, both from an economic and hygienic point of view, are visible everywhere. This is especially true in Kwantung, which is mountainous, yet with few trees on the mountains. The only trees seen in that region, when the administration of it was handed over to Japan, were a few willows and elms near villages and tombs. Nursery gardens were established at Port Arthur, Chinchow and Dairen, to supply saplings for afforestation undertaken by the government. Several million young trees have been planted annually for the past few years.

The Fushun Colliery has instituted a very extensive program of afforestation to provide timber for the mines. It is estimated that 54,000 acres must be planted with 110,000,000 trees, and the program calls for the completion of this plan in a period of thirty years. In the first year, 1919, an area of 980 acres was planted with 2,000,000 young trees, and at the same time 44,000,000 of sprouts were started in the nursery fields.

Also, to encourage the general public in this useful undertaking, forest lands are rented free of charge to those desiring to afforest them, and seeds and young plants are supplied to them. Regulations have also been published for the protection of forests. These measures have had the desired effect, and, with the increase in the interest taken by the public in the matter of afforestation, many nursery gardens owned by villages have been formed.

Varieties of trees—About three hundred kinds of trees are known in Manchuria and Mongolia, but the principal varieties number about twenty. About forty per cent of the forests are conifers, and sixty per cent broad-leafed

trees. Korean pines are the most common conifers. They are frequently from four to five feet in diameter, reaching a height of more than one hundred feet. Oaks, elms and poplars are the most common broad-leafed trees.

Timber industry—As timber markets, Kirin and Antung come foremost, followed by such consuming centres as Harbin, Changchun, Mukden, and Dairen. Kirin has long been a timber centre. Along the eastern section of the Chinese Eastern Railway, the railway management and Russians and Chinese have had railway sidings built to their lumber yards and are operating saw mills. Both Kirin and Yalu timber is carried down the rivers.

(3) Fisheries

Salt water fisheries—With the Yellow Sea to the east and the Gulf of Pechili to the west, and a coast line of 500 miles, the Leased Territory of Kwantung offers an ideal field for the fishing industry. The annual catch of fish there now amounts to more than 2,000,000 yen in value, and no fewer than some 6,000 families, or 18,000 fishermen, are engaged in the work. The catch includes tai, cod, sword fish, *guchi, sawara,* sole, flounders, *suzuki* (bass), shark, *nibe,* sardines, *shirasu,* cuttlefish, octopi, sea-slug, oysters, earfish, prawns, lobsters, crabs, whales, seals, etc.

The whale-fishery about Haiyangtao Island, near which the naval battle took place in the Chinese-Japanese War, is undertaken almost exclusively by the Oriental Whale Fishery Company. The catches are forwarded Shimonoseki way. Seals are captured on the ice-floes when the ice in the coast-waters breaks up on the return of spring in the north of the Yellow Sea and also in the north of the Gulf of Pechili.

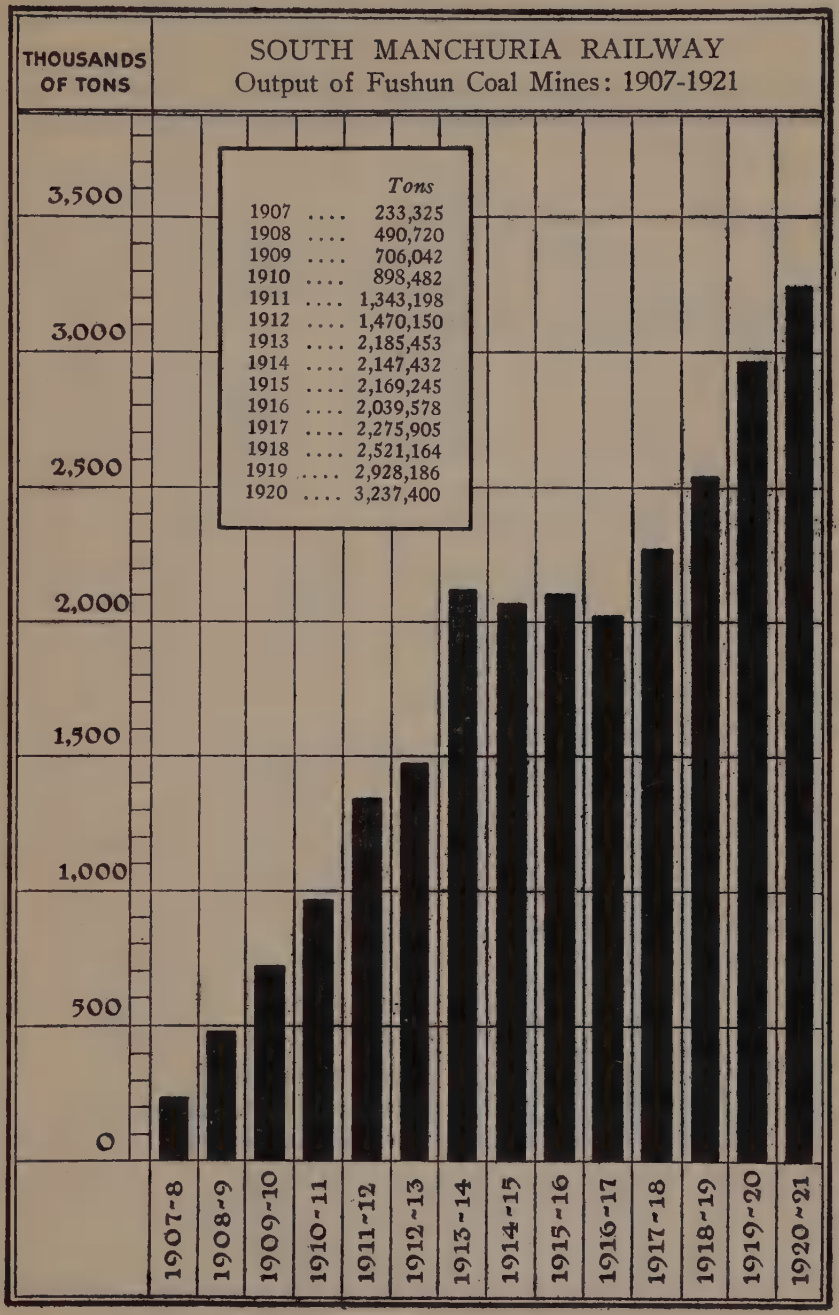
Institution for encouragement of fisheries—For the

benefit of the fishing community the Kwantung Government established an experimental station for fishery products in 1908 at Rokotan, about a mile south of Dairen. The station is provided with factories, fishing gear, storerooms, warehouses and drying-chambers, and also with boats to undertake experimental fishing and explore the adjacent seas. There is also an association which was organized to protect and develop the common interests of the fishing community.

Fresh water fisheries—Fresh water fisheries are extensively conducted in all large rivers, notably in the Liao and Yalu in the south, and the lower reaches of the Sungari and its tributary the Hurka. The fish consist mostly of salmon, salmon-trout, carp, eels, etc. The Sungari also produces pearls. At one time no fewer than 7,000 to 8,000 pearls annually are said to have been taken from that river in the neighborhood of Kirin, but they do not appear to exceed 2,000 a year at present.

(4) Mining

Development of mining—Mining in South Manchuria is of remote origin. Local tradition declares that the coal mine at Fushun was worked as early as the twelfth century, but its working was prohibited by the founder of the late Manchu Dynasty from a superstitious belief in *fengshui* (Spirit of Nature). There were evidently some other mines once worked. But, except for some conspicuous ones, traces of their working have been entirely effaced by the elements, particularly by the landslides caused by the indiscriminate felling of trees once universally perpetrated throughout the country. It seems that most old mines were discovered during the course of this general deforestation, but this same action doomed the fate of the mines thus discovered since it deprived them


THOUSANDS OF TONS
SOUTH MANCHURIA RAILWAY
Output of Fushun Coal Mines: 1907-1921
Tons
1907 233,325
1908 490,720
1909 706,042
1910 898,482
1911 1,343,198
1912 1,470,150
1913 2,185,453
1914 2,147,432
1915 2,169,245
1916 2,039,578
1917 2,275,905
1918 2,521,164
1919 2,928,186
1920 3,237,400
3,500
3,000
2,500
2,000
1,500
1,000
500
0
1907-8
1908-9
1909-10
1910-11
1911-12
1912-13
1913-14
1914-15
1915-16
1916-17
1917-18
1918-19
1919-20
1920-21

of the wood indispensable in mining. Even after the removal of the prohibitory law, every possible obstacle was laid wittingly or unwittingly in the way of mining exploitation.

Mining in the modern sense was first introduced into the country by the Russians, when they, jointly with the Chinese, undertook to work the Fushun coal mine. But real progress in the industry began with Japan's succeeding to the Russian privileges and handing them over to the South Manchuria Railway Company to be worked.

Principal mines—Chinese authorities have listed some 600 places where minerals are located in Fengtien and Kirin Provinces, of which 213 are coal, 26 iron, 234 gold, and the remainder silver, copper and lead.

Gold—Before the introduction of foreign capital for the development of Manchuria's mineral resources, gold was the only metal extensively mined. Manchurian gold is mostly alluvial, and so can be mined with a very small capital. Naturally, all the river beds containing gold dust have been ravaged by gold hunters, and in South Manchuria it is only in these worked-out beds that alluvial gold is now collected. Extensive traces of such mining are found in and around the regions of Hsingking, Tunghua and Huanjen. It is asserted by experts that the alluvial gold of these regions came from gneiss which is abundantly found everywhere in Manchuria, and which always contains some gold. Beaten by the weather the gneiss disintegrated little by little, freeing the gold it contained, which, washed by the rain, deposited itself in the river beds. The most extensive alluvial gold deposits in South Manchuria are found in the tributaries of the Yalu and the upper reaches of the Sungari. In Heilungkiang Province there are many gold fields where ore is still ob-

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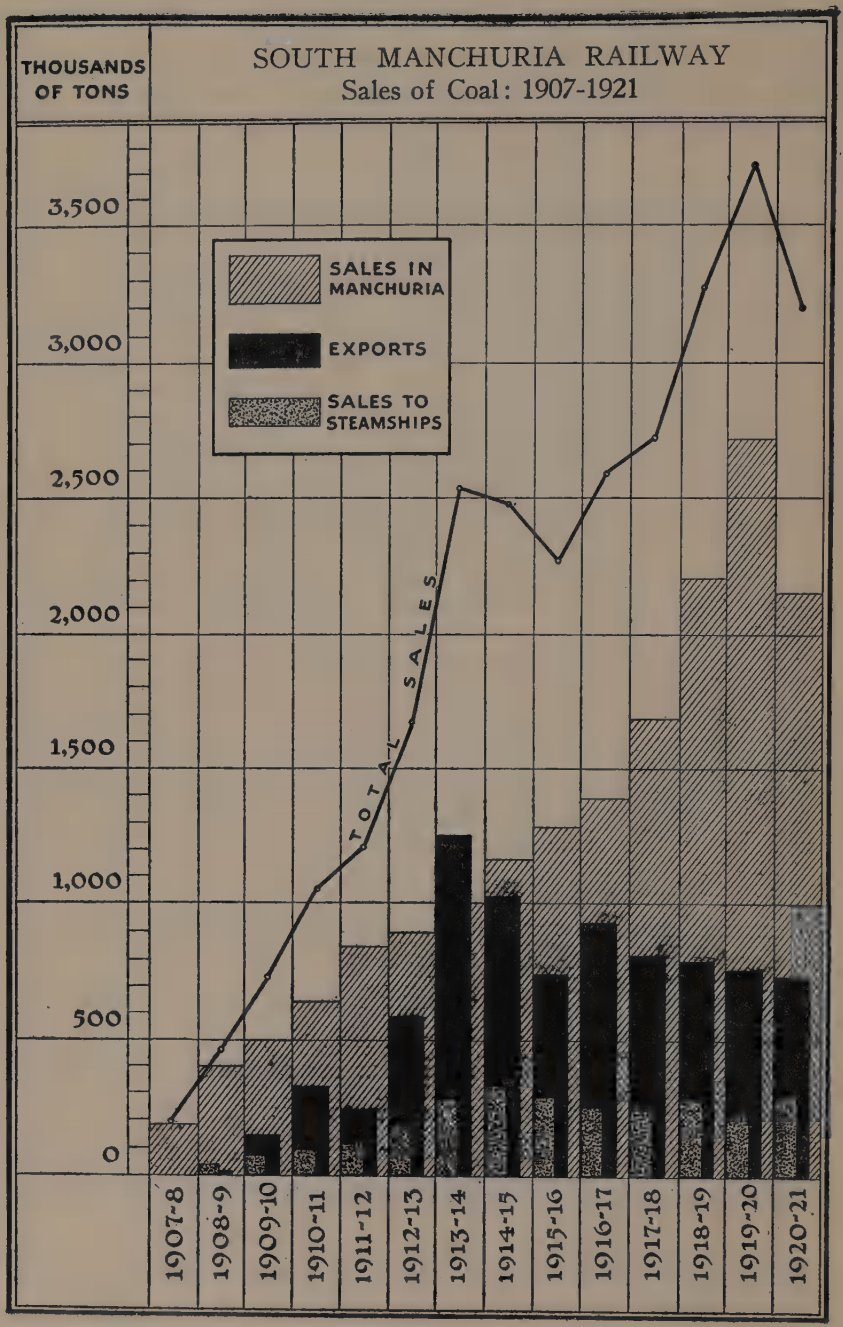
tained in considerable quantities. Chiapikou in Kirin Province was famous for its gold sands years ago, and it is believed that there are still rich veins to be mined.

Iron—Next to coal, iron is the most important mineral product of Manchuria. It mostly exists in veins in metamorphic rocks, and the best veins are generally found in north-eastern Manchuria along the Yalu. These were worked by the natives on a very small scale. The ores are generally hematite, and though the percentage of iron they contain is not large, being generally about forty per cent, they are sufficiently rich to be worked with advantage. Two mines stand out prominently, Penhsihu and Anshan. The former produces about 50,000 tons annually, while the latter, with two hundred million tons of ore reserves, is being developed in conjunction with the new Anshan Steel Works.

Coal—The Fushun coal mines, 22 miles southeast of Mukden, rank among the most important modern industrial enterprises in the Far East. The coal in the Fushun district was first worked by the Koreans some 600 years ago, the coal being used by them in baking earthenware. After the occupation by the Chinese, which took place about 200 years ago, mining was entirely suspended by prohibition of the Chinese government, as Fushun is located in the vicinity of the Mausoleum of Tai-tsu, an Emperor of the Manchu Dynasty, built in the suburb of Mukden. During the Russo-Japanese war the mines were worked on a small scale by Russians, but not until 1907, when the property was transferred to the South Manchuria Railway Company, was mining undertaken on a large scale.

The field, covering the valley of the Yingpan, is ten miles long and two miles wide, and has estimated deposits


THOUSANDS OF TONS
SOUTH MANCHURIA RAILWAY
Sales of Coal: 1907-1921
3,500
3,000
2,500
2,000
1,500
1,000
500
0
SALES IN MANCHURIA
EXPORTS
SALES TO STEAMSHIPS
TOTAL SALES
1907-8
1908-9
1909-10
1910-11
1911-12
1912-13
1913-14
1914-15
1915-16
1916-17
1917-18
1918-19
1919-20
1920-21

of 1,200,000,000 tons of bituminous coal. The coal seams range from 78 to 480 feet in thickness (the thickest in the world), averaging from 130 to 175 feet.

The following are analyses of Fushun coal made on several samples at different times:

Specific gravity	from	1,229	to	1,342
Moisture	from	2,240	to	7,186
Volatile matter	from	38,371	to	48,758
Fixed carbon	from	45,340	to	60,465
Ash	from	1,440	to	9,340
Nitrogen	from	1,100	to	2,307
Sulphur	from	0,338	to	1,738
Calorific value	from	6,160	to	7,700

Color of ash, commonly light brownish grey; ash contains silicic acid, alumina, ferric oxide, sulphuric acid, calcium, and a little percentage of phosphoric acid and magnesium.

Before the mines were taken over by the South Manchuria Railway, they were producing not more than 360 tons a day. During 1911 and 1912, 9,200,000 yen was voted for the first expansion of these mines. The company not only improved the old pits, but opened the Oyama and Togo pits, and increased the daily output to 5,000 tons. The next development opened the Wantawu, Lungfeng, and Hsintun pits, and the open-cut mines at Kuchengtzu and Chienchinchai. The new sand-flushing method was adopted, with an electrified sand-carrying railway, supplied with current from a Mond gas power plant. The daily output was thus increased to 7,000 tons.

The extensive industrial expansion and the use of coal by natives in place of their former fuel of *kaoliang* necessitated the import of coal into Manchuria to the extent of 150,000 tons in 1918, and 490,000 tons in 1919. To satisfy the ever-increasing demand for coal by different industries, particularly that of the Anshan Steel Works,

the company planned another expansion. This was to open three new mines, and combine the two open-cut mines with the view of doubling the output. At present there are two open-cut mines, two perpendicular mines, and six sloping mines with a daily output of 10,000 tons.

The Yentai coal mines have a deposit of about 40,000,000 tons and the present output is about 400 tons a day.

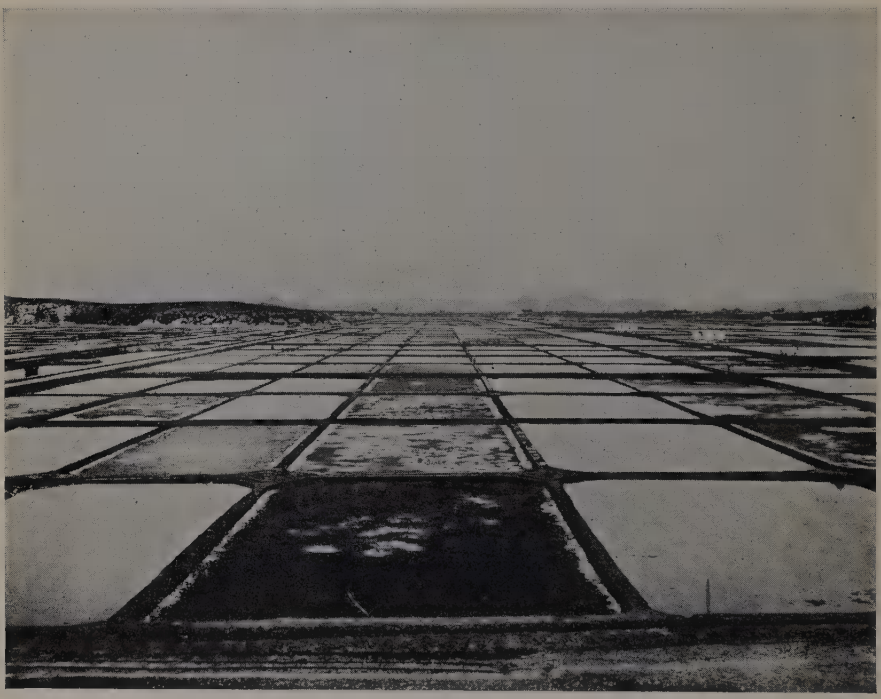
The capital invested in these various coal fields amounts to 40,000,000 yen, and they employ 35,000 workers.

Mines not operated by the South Manchuria Railway—In addition to the Fushun mines, there are coal fields at Penhsihu and Hsintai. The former is a semi-anthracite deposit, from two to nine feet deep, and estimated to contain 200,000,000 tons. It is suitable for making coke for steel works. The Hsintai mines were opened in 1916, and contain six seams from five to thirty feet thick.

Salt—Over the Yellow Sea and the Gulf of Pechili there is little rain and evaporation goes on actively. Therefore, the sea water is brinier, and salt manufacture is conducted very extensively along the sea coasts. At Yingkou, Kaiping, and Fuchou, the salt gardens under the management of the Chinese Government and private individuals lie in an almost unbroken line. The sea water is put in the salt gardens by means of the tide and windmills, and is left to evaporate in the sun. The salt industry in conducted vigorously also in the Kwantung Leased Territory. The yearly output averages 150,000,000 bushels, of which about one quarter is in Kwantung. Salt is a monopoly of the Chinese Government. The Government buys salt manufactured along the sea coast and sends it to different centres to sell at a specified price. The import of salt into Manchuria is forbidden. Salt produced in Manchuria is debarred from export, except

Iron ore deposits at West Anshan, belonging to the Anshan Steel Works

Takushan iron mine at Anshan, Manchuria



Salt fields at Pulantien. Along the coast, sea water is put in salt-gardens and left to evaporate in the sun

The Oyama shaft at the Fushun Collieries. The daily output of coal at Fushun approximates 10,000 tons

American steam shovel at work in the Fushun Colliery

Mund gas works, connected with the Fushun Colliery

to Mongolia and the Jehol district. Kwantung salt is exported to Japan and Chosen, and this trade is increasing.

Natural soda—In Eastern Inner Mongolia are large deposits of natural soda. The low plains, lakes and swamps become white in the dry seasons in spring and autumn. Sometimes the soda forms in layers and presents a beautiful sight. Natural soda is worked at the native soda depots. From spring to summer, crude soda is compressed into the form of brick, and from autumn to winter crystallized soda of comparatively fine quality is obtained. In Chelimu Tribe (Inner Mongolia) is located a lake, Tapusu, abounding in soda. On the upper part of the West Liao River there is a plain known as Pali-Shantien Chientzu which also yields a good quantity of natural soda. As means of transportation are developed with the diffusion of civilization, the natural soda of Inner Mongolia is bound to be exploited.

Magnesite—Manchuria abounds with limestone, which usually contains more or less magnesite. Near Tashihchiao (the junction station for the Yingkou Branch Line) a magnesite deposit of exceptional dimensions has been discovered. It has proved excellently suited to the making of fire-bricks, and is now supplied to the Government Steel Works, Edamitsu, Japan, and the Anshan Steel Works.

Other minerals—Talc, mica, asbestos, fluorspar, sulphur, nitre, felspar and silica are also found in Manchuria. The South Manchuria Railway, through its Geological Institute, is encouraging the development of these resources.

III. DEVELOPMENT OF MANUFACTURING

The new industrial era—Prior to the building of the South Manchuria Railway the Chinese in Manchuria were engaged almost entirely in agricultural pursuits, or primitive manufacturing industries based on agriculture. They pressed oil from soya beans for food and light, ground flour, distilled native drinks, made coarse silk, wove baskets and produced other necessities of life as a by-product of farming.

But within a very few years, with the coming of American locomotives, steam shovels, mining machinery, electric generators—all the varied labor-saving machines of the modern industrial era—a great change has taken place in this ancient land of the Manchus. Millions of foreign capital, largely from Japan, have poured into Manchuria to be used in developing her rich stores of raw materials, and in establishing new industries for their utilization. The South Manchuria Railway since its establishment has purchased in America $75,000,000 worth of railway equipment and materials, and machinery for mining, steel-working and other industries.

The industrial development of Manchuria along modern lines is being fostered by the South Manchuria Railway through the Central Laboratory, the Geological Institute, the Agricultural Experiment Stations, the Bureau for Economic Research, and other similar organizations.

The growth of manufacturing in Manchuria is shown by the following reports:

Factories in Kwantung Leased Territory (1918)

	Factories	Capital (Yen)	Products (Yen)
Port Arthur	15	539,500	341,179
Dairen	155	40,880,001	109,426,117
Palantien	7	155,000	603,544
Pitzuwo	20	148,000	823,483
1918	197	41,722,501	111,194,323
1917	216	36,127,661	58,313,003
1916	204	33,628,496	43,137,839
1915	198	21,784,865	27,697,647
1914	187	20,936,561	14,454,438
1913	202	20,357,630	23,534,072
1912	204	22,424,192	22,246,852
1907	77	1,924,174	2,681,868

Factories in Railway Zone (1918)

	Factories	Capital (Yen)	Products (Yen)
Yingkou	1	55,478	90,000
Wafangtien	14	166,000	869,262
Liaoyang	6	451,712	1,389,510
Anshan	11	370,000	514,585
Mukden	10	10,676,000	3,420,255
Penhsihu	9	7,042,000	8,355,406
Fushun	20	6,913,850	2,143,945
Tiehling	1	3,000,000	2,338,545
Kaiyuan	15	900,000	1,961,217
Changchun	18	4,291,500	3,768,216
Saupingchieh	5	155,000	495,630
Kungchuling	4	85,771	304,156
Antung	17	1,629,000	6,319,688
1918	131	33,736,311	31,970,415
1917	117	29,855,245	29,648,862
1916	92	16,722,531	11,666,113
1915	71	11,593,676	9,773,849
1914	57	3,600,269	6,344,758
1913	53	4,009,131	4,386,513
1912	41	2,448,265	3,681,381

In North Manchuria and along the line of the Chinese Eastern Railway a number of factories are located. In North Manchuria the last published reports showed 18 steam flour mills, 30 breweries, 1 sugar mill and 4 steam lumber mills. Along the Chinese Eastern Railway the last reports showed 13 bean mills, 15 breweries, 13 workshops, 3 tobacco factories, 1 sugar mill and 12 other factories.

Bean oil and bean cake—Bean milling ranks foremost in Manchurian manufacturing industry. Since ancient times the Chinese have used the oil of the soya bean as food and a source of light, but only within the past few years, since the South Manchuria Railway inaugurated its campaign of industrial development, has the soya bean and its varied products become of importance in world trade.

Native *yufang,* or oil mills, are found everywhere in Manchuria, and in these the cake is ground by mules or donkeys and the oil is expressed by hand labor. The residue is bean cake. The Japanese introduced power presses, driven by steam, electric, gas and water power, and most of the modern mills are of this type.

A much more efficient method has lately been developed through the research department of the South Manchuria Railway. This is the chemical extraction method. The beans are soaked in benzine until the oil is dissolved. Then, by heating the compound, the oil is separated from the benzine. By this method nearly all the oil in the beans is extracted, and not only is there no waste of oil, but the residue, in this case not in the form of cake but in bulk, is better fitted for fertilizer. By the expression system, 133 pounds of beans give about 12½ pounds of bean oil and two pieces of bean cake each weighing 61 pounds. By

the chemical extraction system the same amount of beans usually gives 17½ pounds of bean oil and 106 pounds of bean meal. The new method is at present employed by only one company, Suzuki & Company, in Dairen, which firm operates the largest bean-mill in Manchuria. Yingkou was formerly the center of bean milling in South Manchuria, but Dairen is now far in the lead, with more than sixty mills producing 390 tons of oil and 3700 tons of bean cake a day.

The Chinese have used bean cake largely as cattle feed and very little as fertilizer. But recently the cake has found a growing market in Japan and China as a fertilizer as well as cattle feed.

To facilitate the shipment and marketing of soya beans the South Manchuria Railway has organized a "mixed storage system." Beans are classified at receiving points, and receipts, negotiable at the bank, are issued, which call for the delivery of like quantities and qualities at terminal points.

Flour milling—There are two kinds of flour-mills in Manchuria called respectively *mofang* and *huomo,* which literally mean "grinding house" and "fire mill". The former is the native mill which, employing two to ten coolies and four to twelve donkeys, conducts the work on a small scale. This kind of mill is found everywhere in Manchuria, and constitutes the local manufacture only next in importance to distilling and oil-milling. However, mills of this kind are mostly conducted as a by-work by grain merchants, distilleries and oil mills. The "fire mill" is the mill provided with modern machinery to which steam or electricity is applied as the motive power.

Flour mills planned on an extensive modern scale in South Manchuria have come into existence under Japan-

ese management since the close of the Russo-Japanese War. The Manchuria Flour Mill at Tiehling was the first of the kind to be founded. Since then other mills have been established at Mukden, Changchun, Kaiyuan, Kirin and Dairen.

A recent Japanese Consular report shows that there are 45 flour mills in Manchuria with an annual capacity of 19,000,000 bags and a market value of $30,000,000. The Japanese mills have a daily capacity of 25,000 bags. The largest company is the Manchurian Flour Mill Company, with a daily output of 17,500 bags in its mills at Harbin, Changchun, Tiehling and Mukden. The Chinese-Japanese Flour Mills at Dairen and Changchun have an output of 5,600 bags and the Asia Flour Mills at Kaiyuan produce 2,000 bags a day. There are 36 Russian and Chinese mills with a daily output of 38,400 bags. During 1919, 1920 and 1921 more than 500,000 tons of Manchurian wheat was exported to Europe, but this was an unusual movement due to special trade conditions. Normally Manchuria has an import balance of flour.

Beet sugar—One of the newest industries in Manchuria is the manufacture of beet sugar. An experimental farm was established outside Mukden in 1906, and it was shown that sugar beets could be successfully raised in Manchuria, but the industry was not established until the South Manchuria Railway had conducted successful experiments in 1913-1914. The formation of the South Manchuria Sugar Refining Company at Mukden in 1916 by Japanese capitalists followed. The Russians had previously built a factory near Harbin, and a Chinese factory had been established at Hulan, also in North Manchuria. The Mukden refinery was opened with a capital of 10,000,000 yen, and has been a great success. Beets are cultivated over an area of 6,000 acres, supplying the refinery

during the winter months. Crude sugar is imported for refining during the remainder of the year.

Distilling—The distilling of beverages for domestic consumption has always ranked as an important native industry in Manchuria. The liquors used by the Chinese are chiefly *shumshu* (sorghum alcohol), distilled from *kaoliang* and *huangchiu,* made from millet. The distilling of *kaoliang* spirit is native to Manchuria. The grain is mashed and steamed, and there is added to the mash barley-malt or bean-malt, and a small quantity of wheat or corn. The cask is buried in the ground for some days and let ferment, after which the contents are distilled. The product is similar to whiskey. Mukden and Liaoyang are the centers of the distilling industry, the output of which is about 13,000,000 yen a year.

Brewing—From barley and hops raised in Manchuria, beer is now being made by the Manchuria Beer Brewery Company. The fermenting of *sake* has also been undertaken at various places.

Wild silk—The greater part of the wild-silk cocoons produced in Manchuria have been exported, and Chefoo in Shantung, a center of the silk industry, has reeled much of the Manchurian silk. Small wild-silk filatures are operated by many Chinese farmers in Manchuria who use very primitive methods. The *tussah* silk produced by the natives has not been of good quality, and the Dairen Central Laboratory for some time has been devoting much attention to improving the manufacturing methods. As a result, the industry has been developing, especially in Antung. Silk spinning should eventually be one of the largest Manchurian industries.

Iron and steel—One of the most ambitious undertakings of the South Manchuria Railway has been the build-

ing of the great steel works at Anshan, to utilize the ore of the Anshan iron mines. Since 1917, when the work was inaugurated, the development of this plan has gone steadily forward. Millions of dollars worth of modern equipment and machinery was imported from the United States, and the installation has been made under the most approved American engineering practices.

Blast furnace No. 1 with a capacity of 200 tons a day, a charging elevator, four hot stoves, two blowing engines, four boilers, two generators of 3,000 kilowatts each, and settling and cooling ponds, a filter bed, a water tower, etc., were completed in 1918, and the furnace was lighted in April, 1919. Blast furnace No. 2 was completed in 1920. The charging elevator, electric tramway, water circulating system, ore depot, etc., for the second furnace were also installed. Two batteries of coke ovens (one battery consisting of 40 ovens), together with the coal washing system, were finished, and were brought into service early in 1920. Two more batteries were added in the following year. Ultimately it is planned to increase the output to a million tons of iron a year.

At Penhsihu another steel works is in operation, producing 200 tons of pig iron a day. It draws its ores from Miaoerkow, 24 miles away. The capital (14,000,000 yen) is supplied by Chinese and Japanese.

Chemical industry—Notable progress has been made in the development of the chemical industry, as a result of the research work of the Dairen Central Laboratory, and the future holds out great possibilities and opportunities.

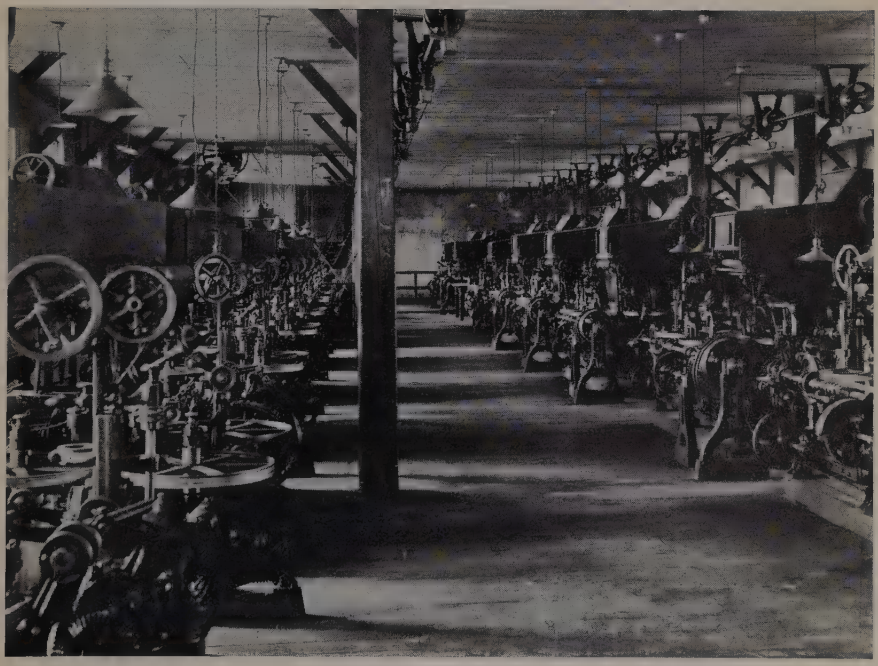
As Fushun coal was found to contain a high percentage of nitrogen (1.6 per cent), a gas producer plant was installed in 1914 to recover the ammonia. A second was put

Anshan Steel Works operated by the South Manchuria Railway Company

Decorating bowls in the ceramic factory at Dairen

A primitive pottery works in Manchuria

Chinese dyers dyeing their cloth in the sun



Interior of the Asiatic Tobacco Company factory at Yingkou

Coke ovens at the Anshan Steel Works, one of the great modern industries of South Manchuria

up in 1917 and a third is now in course of construction. The daily output is thirty tons of ammonium sulphate and thirty tons of coal tar. Sulphuric acid, calcium carbide, calcium cyanide and other chemicals are being produced. Two sets of sulphuric acid plants, with a daily capacity of fifty tons, have been installed.

The beehive coke ovens at Fushun are producing sixty tons of coke a day. An installation of thirty sets of by-product recovery coke ovens is being planned.

At Dairen there are the Electro-Metallurgical Company, the Manchuria Barium Industry Company, the Solite Manufacturing Company, the China Electric Industry Company, the East Asia Electric Industry Company, the South Manchuria Electricity Company and the Manchuria Paint Company. At Fushun is the Electro-Chemical Company, at Mukden the Mukden Chemical Company, and at Antung the Manchuria Blasting Powder Factory.

Cement—The ever-increasing demand for cement in Manchuria, North China and Eastern Siberia on the one hand, and the abundant presence of the material necessary for its manufacture, limestone and clay, on the other, induced the Onoda Cement Company of Japan to establish a branch factory in the small town of Choushuitzu, a suburb of Dairen, as early as 1907. The output is 250,000 barrels a year. The factory is ideally situated, the limestone being obtained from the hills right behind it and the clay in the field just in front, and a line of railway has been built to connect the factory with the railroad. The factory output consists of cement, paving bricks and building bricks. At Choushuitzu is also located the Dolomite Cement Company, and there is another cement plant at Mukden.

Glassware—With plenty of silicious rock at hand, glass-making has been stimulated by the Ceramic Experimental Institute at Dairen, and progress is being made in the commercial development of the industry.

Pottery—The pottery division of the Ceramic Experimental Institute was transferred to the China Ceramic Company in 1920. Other pottery factories have been started in Mukden, Dairen, Kungchuling and Choushuitzu, and in addition there are a number of kilns engaged in making firebrick. Wulakai in Kirin has long been a pottery center.

Lumber—Many sawmills are now in operation at Antung, at the mouth of the Yalu, and at Kirin on the Sungari River. The lumber industry on the Yalu River has been developed by the Yalu Lumber Company, a Chinese-Japanese organization established in 1908 with a capital of 3,000,000 yen. This same company also organized the Yalu Sawmill Company, with a capital of 500,000 yen. At Kirin are located the Mitsui Company's mill, the Kirin Timber Company and a branch of the Yalu Sawmill Company.

Other industries—Along the lines of the South Manchuria Railway many new industries have been started since the extension of modern transportation facilities and the opening up of new sources of basic raw materials. The railway is fostering this industrial development through its research work, a description of which is given in Chapter V. Among other Manchurian industries brief mention may be made of the following:

Starch is made from beans, *kaoliang* and corn by the Manchuria Starch Company at Port Arthur and the Dairen Starch Factory at Dairen. At Chientao starch is made from potatoes.

Smoking tobacco is manufactured in the Yingkou and Mukden factories of the East Asia Tobacco Company, which has grown to be a formidable competitor of the British-American Tobacco Company. Smaller tobacco factories are also located at Mukden, Dairen and Changchun.

Hard oil, stearine, glycerine and soap are made from soya bean oil by the Dairen Fat and Industrial Oil Company, and the Mukden Chemical Company is producing gelatine and animal and vegetable oils.

Bean noodles for South China and the South Seas are made by the Chinese-Japanese Bean Noodle Company. Two new companies at Dairen are making imitation rice from *kaoliang.*

The cereal *kaoliang,* as a result of research work of the South Manchuria Railway, has become useful in many ways. Calcium lactate is an important by-product. Lactate acid is made from the calcium lactate and is used extensively in fermentation, dyeing, tanning and other industries. The manufacture of paper from *kaoliang* pulp is another growing industry. The pulp closely resembles timber pulp and makes an excellent grade of paper. From the ash of *kaoliang* stalks potassium salts are obtained for use in the manufacture of glass, medicines, fertilizers and other products.

Hemp bags and other products are made by the Manchuria Hemp Manufacturing Company at Dairen, and the Manchuria-Mongolia Fibre Industry Company at Mukden.

Boat building and repair work is undertaken by the Dairen branch of the Kawasaki Dockyard Company.

Railroad car and engine shops, equipped with the best American machinery, are operated by the South Man-

churia Railway at Shakakou (near Dairen) and Liaoyang. Other iron-working plants are the Dairen Machinery Works, the Manchuria Mechanical Works, the Antung Iron Works and the Osaka Iron Works.

Among other Japanese enterprises may be mentioned the manufacture of matches, gunpowder, fertilizer, dyestuffs and wickerwork.

Paper mills at Kirin, Liaoyang and Petuna, and dyeing and weaving works at Yingkou, Liaoyang and Chinchow are among the long-established native industries.

Industries based on wool and leather have been recently started. Formerly hides, bones, wool and other animal products were exported. At Mukden are located the Manchuria-Mongolia Fabric Industrial Company (capital 3,000,000 yen) and the Manchuria-Mongolia Wool-Weaving Company (capital 10,000,000 yen). Other factories are located at Harbin, Mukden and Dairen. The largest is the Manchuria-Mongolia Shokusan Company (capital 5,000,000 yen).

IV. COMMERCE AND FINANCE

(1) Foreign Trade of Manchuria

An economic miracle—The American traveler in Manchuria today, who rides in comfort in a Pullman sleeping car behind a Baldwin locomotive, over 100-pound Pittsburgh rails; from the modern port of Dairen, with its beautiful plaza, and its great modern banks, business houses and public buildings; and then northward through cities lighted by electricity, with modern railway stations, paved streets, modern hotels, schools, hospitals and scientific laboratories; past American-equipped steel works, coal mines and factory buildings—with such a magic transformation before his eyes the traveler finds it difficult to believe that only a few years ago this country was the home of the Manchu rulers of China and a forbidden land to world commerce.

Trade was a business of the lowest caste of Chinese, and particularly in Manchuria, as the Manchu Dynasty forbade the desecration of this sacred ground even by the Southern Chinese. Manchuria for the first time was connected with Shanghai, the economic center of China, when the port of Newchwang (now Yingkou) was opened to trade by the Tientsin Treaty (1858) between England and China. But it was half a century later before Dairen, Antung and the other ports of Manchuria were opened to the trade of the world.

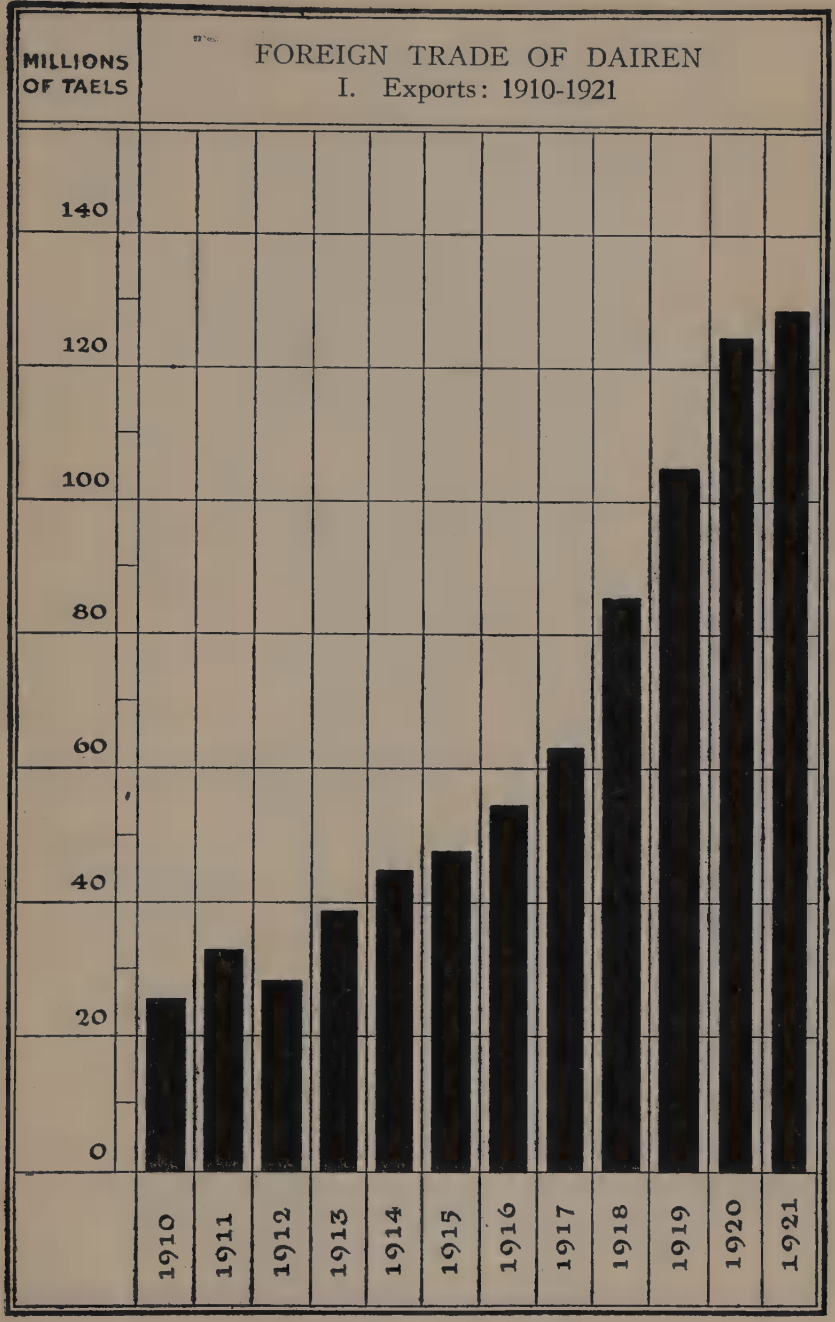
A very slow development of Manchurian trade followed the opening of the port of Newchwang. It was not until 1900 that the Russians began the construction of the Chinese Eastern Railway, which was to give them, in connection with their Trans-Siberian line, an outlet on the Yellow Sea at Port Arthur. But the real awakening of Manchuria came with the Russo-Japanese War of 1904, and the taking over of the southern portion of the railway line by the Japanese in 1907 under the terms of the Treaty of Portsmouth. Since then Manchurian commerce has grown tremendously.

The gateways of Manchurian trade are Dairen, Yingkou, Antung and Vladivostok. Of these four the port of Dairen has made the most conspicuous progress. It has now outstripped Tientsin, and leads all other Chinese ports, except Shanghai.

Growth of the Port of Dairen—The growth of Dairen as a shipping port is indicated in the following table showing the number and tonnage of vessels arriving at the Dairen wharves since 1908:

Vessels Arriving at Dairen

	Number of Vessels	Gross Tons
1908	1,357	1,829,921
1909	1,390	2,238,707
1910	1,542	2,410,885
1911	1,688	2,662,943
1912	1,865	2,872,122
1913	2,117	3,556,250
1914	2,200	3,838,078
1915	2,113	3,461,530
1916	1,942	3,095,257
1917	2,019	3,118,715
1918	2,516	3,473,397
1919	2,891	4,380,920
1920	2,942	4,864,904


MILLIONS OF TAELS
FOREIGN TRADE OF DAIREN
I. Exports: 1910-1921
140
120
100
80
60
40
20
0
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921

Before the European War the American flag was rarely seen in the port of Dairen, but since the war there has been a very large increase in American tonnage. The following table shows the tonnage of vessels of the principal maritime nations arriving at Dairen every third year since 1908:

Shipping Tonnage Arriving at Dairen: By Countries

	Japanese	Chinese	British	American	Others
1908.....	1,407,778	31,041	310,756	.....	80,346
1911.....	1,872,294	55,818	398,141	.....	336,690
1914.....	3,034,075	98,476	433,909	3,302	268,316
1917.....	2,628,570	176,853	183,596	8,198	121,498
1920.....	3,408,369	483,073	421,028	381,729	170,705

The other leading nations represented in the 1920 arrivals were: Russian, 34,146 tons; French, 18,277 tons; Norwegian, 11,618 tons. Before the war the German tonnage ranked next to the Japanese and British, reaching 307,000 tons in 1913.

A large part of the imports unloaded at the Dairen wharves naturally comes from the neighboring countries of the Far East, but, since the South Manchuria Railway began making heavy purchases in the United States, there has been a very considerable overseas trade. The tonnage of imports from the different countries for 1908 and for the period 1914-1920 is shown herewith:

Tonnage of Imports Into Dairen: By Countries

	Japan	China	Chosen	U.S., Europe and Others	Total Tons Imported
1908.....	214,551	14,442	15,584	92,350	336,927
1914.....	258,865	121,367	17,009	108,533	505,774
1915.....	240,685	164,062	20,948	111,535	537,230
1916.....	313,131	194,316	26,689	65,786	599,922
1917.....	424,065	278,130	35,893	95,180	833,268
1918.....	466,144	392,952	27,930	69,519	956,545
1919.....	730,004	528,153	16,887	135,575	1,410,619
1920.....	588,519	274,730	22,938	88,028	974,215

Loading soya beans and bean cakes for export at Dairen

Dairen wharves

"Sakaki Maru", one of the Dairen-Shanghai steamers

Chinese bat-winged junks at Dairen

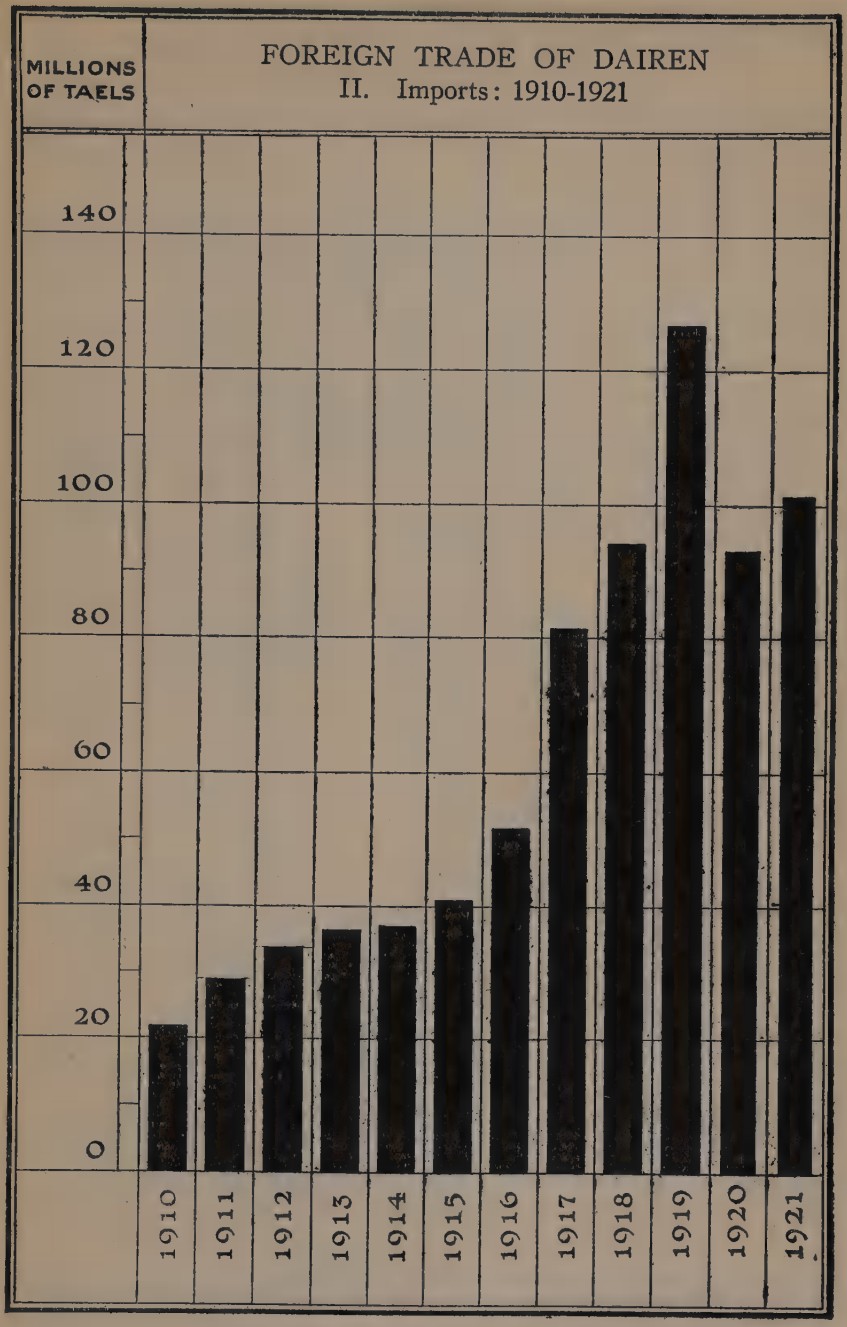
Dairen wharves

Ohhiroba Plaza, Dairen

Facilities for quick travel connections are found at Dairen

Picturesque lumber rafts on the Yalu River near Antung

New South Manchuria Railway bridge built over the Hun River near Mukden


MILLIONS OF TAELS
FOREIGN TRADE OF DAIREN
II. Imports: 1910-1921
140
120
100
80
60
40
20
0
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921

The value of Dairen's foreign trade has greatly increased, the total exports and imports being now about seven times as large as in 1908. The record of the maritime customs trade of Dairen, in Haikwan taels, from 1908 to 1920, is shown in the three tables following:

Value of Imports at the Port of Dairen

	From foreign ports (taels)*	From Chinese ports (taels)*	Total imports (taels)*
1908	17,215,936	3,060,713	20,276,649
1909	12,239,563	5,301,512	17,541,075
1910	18,634,071	4,081,757	22,715,828
1911	24,012,724	5,773,676	29,786,400
1912	27,069,793	7,803,390	34,873,183
1913	28,740,282	8,310,263	37,050,545
1914	28,891,565	9,002,518	37,894,083
1915	24,865,452	16,581,350	41,446,802
1916	33,358,199	19,073,167	52,431,366
1917	58,274,497	23,690,843	81,965,340
1918	66,979,626	28,622,292	95,601,918
1919	89,521,323	37,855,853	127,377,176
1920	71,040,883	22,028,602	93,069,485

Value of Exports at the Port of Dairen

	To Chinese ports (taels)*	To foreign ports (taels)*	Total exports (taels)*
1908	5,069,133	7,342,402	12,411,535
1909	4,435,915	22,308,444	26,744,359
1910	6,077,480	20,115,933	26,193,413
1911	9,724,395	24,006,581	33,730,976
1912	9,090,823	19,795,121	28,885,944
1913	9,298,702	29,749,041	39,047,743
1914	8,504,480	36,601,327	45,105,807
1915	15,171,438	33,714,202	48,885,640
1916	11,572,920	43,135,327	54,708,247
1917	16,163,469	47,023,741	63,187,210
1918	13,623,491	72,389,242	86,012,733
1919	7,767,101	97,243,766	105,010,867
1920	16,842,406	108,223,857	125,066,263

*Chinese customs returns are reported in Haikwan silver taels. The exchange value of the tael varies with the price of silver. From 1908 to 1915 the average value of the tael in United States currency was 67 cents. In 1916 it was 79 cents; 1917, $1.03; 1918, $1.26; 1919, $1.39; 1920, $1.24.

Exports and Imports: Port of Dairen

	Imports (taels)*	Exports (taels)*	Total (taels)*
1908	20,276,649	12,411,536	32,688,184
1909	17,541,075	26,744,359	44,285,434
1910	22,715,828	26,193,413	48,909,241
1911	29,786,400	33,730,976	63,517,376
1912	34,873,183	28,885,944	63,759,127
1913	37,050,545	39,047,743	76,098,288
1914	37,894,083	45,105,807	82,999,890
1915	41,446,802	48,885,640	90,332,442
1916	52,431,366	54,708,247	107,139,613
1917	81,965,340	63,187,210	145,152,550
1918	95,601,918	86,012,733	181,614,651
1919	127,377,176	105,010,867	232,388,043
1920	93,069,485	125,066,263	218,135,748

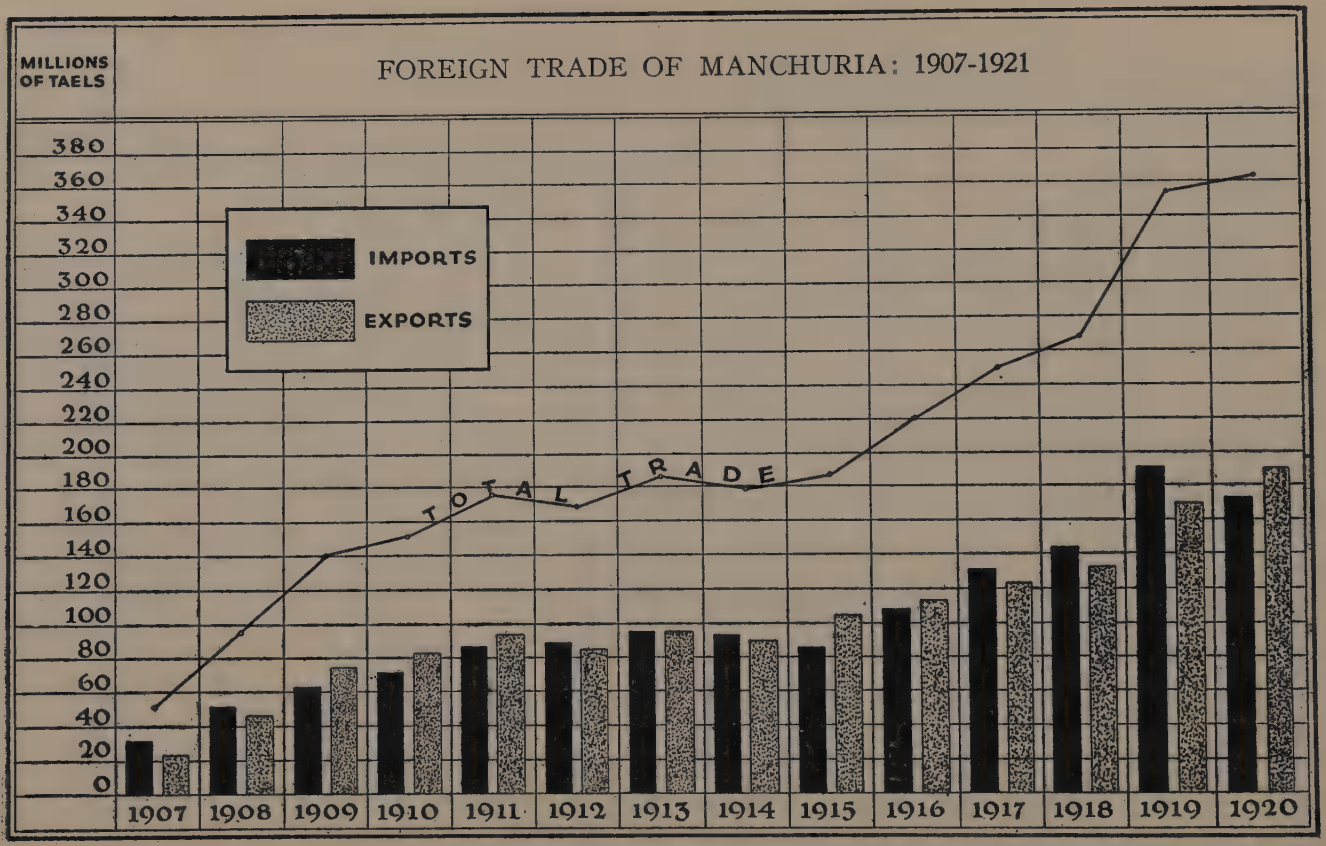
Dairen's export trade is largely made up of agricultural products and coal. In tonnage, soya bean products are more than sixty per cent of the exports. The growth of the export trade in the principal items since 1908 is shown in the following table:

Commodities Exported from Dairen (in Tons)

	1908	1911	1914	1917	1920
Beans	182,629	272,457	255,112	191,780	567,129
Bean cake	204,627	446,801	512,823	852,867	1,131,208
Cereals	13,781	97,004	118,259	198,684	707,237
Coal	7,703	91,115	559,761	494,645	212,589
Sundries	28,646	39,285	98,518	258,332	278,935
Total	437,386	946,662	1,544,473	1,996,308	2,897,098
Bunker coal	15,276	55,322	247,193	206,131	195,428

Foreign trade of Manchuria—With the development of the port of Dairen, the gateway to Manchuria, the foreign trade of the country has grown apace. Three years after the Russo-Japanese War, when Dairen and Antung were opened to commerce, the total trade reached $40,000,000. In the first year after the close of the European War it had risen to nearly $500,000,000. The foreign

*See note page 54.


MILLIONS OF TAELS
FOREIGN TRADE OF MANCHURIA: 1907-1921
380
360
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
IMPORTS
EXPORTS
TOTAL TRADE
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920

trade returns for the ten years, 1911-1920, are as follows:

Foreign Trade of Manchuria (in U. S. Dollars)

	Imports from foreign ports	Imports from Chinese ports	Total imports	Exports	Total trade
1911.....	$44,534,998	$17,937,313	$63,472,311	$64,924,367	$128,396,678
1912.....	56,317,522	11,976,123	68,293,645	63,971,900	132,265,545
1913.....	54,235,006	15,694,743	69,929,749	68,686,000	138,616,749
1914.....	49,572,049	12,200,072	61,772,121	59,222,365	130,994,486
1915.....	37,596,850	13,087,901	50,684,751	62,976,622	113,661,373
1916.....	65,640,144	16,654,894	82,295,038	77,918,602	160,213,640
1917.....	116,163,316	24,370,924	140,534,240	130,603,813	271,138,053
1918.....	127,292,793	42,229,907	169,522,790	149,251,197	318,773,987
1919.....	209,637,624	56,668,535	266,206,159	224,041,347	490,247,506
1920.....	156,990,557	50,923,282	207,913,839	221,517,637	429,431,476

Principal exports and imports.—Manchuria exchanges her raw materials for the manufactures of other countries. She imports little raw material, and exports few manufactures. The country is still primarily agricultural, although manufacturing is rapidly developing. The soya bean is the foundation of her trade, comprising about half the value of all exports. The values of the principal exports in 1920 were as follows:

Bean cakes	$60,236,000
Beans	35,098,000
Bean oil	22,131,000
Wheat	28,214,000
Other cereals	19,651,000
Coal and coke	8,688,000
Wild silk yarn	7,680,000
Wild silk cocoons	2,627,000
Kaoliang	7,122,000
Lumber	3,935,000
Corn	2,672,000
Metals	2,488,000

Values of some of the principal imports in 1920 were:

Cotton goods	$62,099,000
Cotton yarns	17,009,000
Metals	14,477,000
Machinery	8,531,000
Tobacco	9,090,000
Fabrics (other than cotton)	8,084,000
Bags	7,347,000
Kerosene	6,087,000

A more detailed picture of the foreign trade of Manchuria is presented in the following analysis of the imports and exports for 1920, as reported by the American Consul General at Mukden:

Imports Into Manchuria—1920

		Quantities	Values
Bags	pieces	34,208,191	.....
Belting machine		.....	$194,775
Building materials		.....	559,097
Butts and hinges		.....	123,624
Cement	pounds	88,121,411	.....
Cotton, and manufacturers of.			
Blankets	pieces	187,678	.....
Canvas and cotton duck	pieces	547,957	.....
Chinese cotton goods—			
Drills	pieces	64,047	.....
Nankeens	pounds	4,286,590	.....
Sheetings	pieces	484,674	.....
Yarn	pounds	8,631,612	.....
Drills—			
American and English	pieces	10,064	.....
Japanese	pieces	135,778	.....
Handkerchiefs	dozen	154,103	.....
Imitation native cloth	yards / pieces	55,341,956 / 864,102	.....
Japanese cotton cloth	yards	1,545,827	.....
Poplins, cotton Italians, Venetians, crepe, dyed drills and lastings	pieces	379,553	.....
Prints, plain cotton	pieces	146,292	.....
Sheetings—			
American and English	pieces	45,546	.....
Japanese	pieces	3,770,623	.....
Shirtings—			
White	pieces	731,310	.....
Grey—			
American and English	pieces	62,993	.....
Japanese	pieces	1,661,952	.....
Towels	dozens	280,332	.....
Thread—			
In balls	pounds	49,077	.....
On spools	gross	184,257	.....
Velvets and velveteens	yards	174,464	.....
Yarns—			
English		.....	.....
Indian	pounds	2,069,081	.....
Japanese	pounds	15,956,143	.....
Electrical materials and fittings		.....	2,013,541
Flour, wheat	pounds	10,826,333	.....
Haberdashery		.....	236,776
Hardware		.....	250,964
Leather		.....	1,509,938
Machinery		.....	2,601,149
Matches	gross	1,157,902	.....
Medicines		.....	872,924

		Quantities	Values
Metals and minerals—			
Brass bars, sheets, etc.	pounds	2,473,002	.....
Copper—			
Bars	pounds	105,868	.....
Ingots and slabs	pounds	9,756,082	.....
Graphite	pounds	718,466	.....
Iron—			
Bars	pounds	21,255,528	.....
Angles and tees	pounds	8,010,191	.....
Nails and rivets	pounds	7,601,083	.....
Pig	pounds	9,652,608	.....
Sheets and plates	pounds	15,391,159	.....
Galvanized sheets	pounds	6,651,596	.....
Lead in pigs and bars	pounds	1,045,646	.....
Steel (sheets, plates, etc.)	pounds	2,604,938	.....
Tin in slabs	pounds	241,661	.....
Tinned plates	pounds	5,465,901	.....
Oil—			
Kerosene—			
American	gallons	11,088,123	.....
Japanese	gallons	309,545	.....
Russian	gallons	946,154	.....
Sumatran	gallons	3,208,181	.....
Lubricating	gallons	1,955,464	.....
Paper	pounds	76,556,928	.....
Railway materials		.....	994,334
Rice	pounds	27,653,227	.....
Shoes, leather	pairs	418,723	.....
Soap—			
In bars	pounds	3,226,048	.....
Toilet		.....	369,114
Soda	pounds	13,249,061	.....
Stores		.....	551,030
Stationery		.....	533,106
Sugar:			
Brown	pounds	11,443,852	.....
White	pounds	12,046,475	.....
Refined	pounds	19,594,491	.....
Candy	pounds	1,193,143	.....
Vehicles—			
Locomotives and parts		.....	871,105
Motor cars		.....	361,597

Exports from Manchuria—1920

		Quantities	Values
Bean cake	tons	1,280,801	.....
Bean meal	pounds	28,526,106	.....
Beans	tons	597,942	.....
Bristles	pounds	364,784	.....
Cement	pounds	17,958,965	.....
Cereals—.			
Barley	pounds	14,263,984	.....
Buckwheat	pounds	5,670,854	.....
Kaoliang	pounds	232,360,842	.....
Maize	pounds	85,886,612	.....
Millet	pounds	301,282,373	.....
Rice	pounds	11,822,769	.....
Wheat	tons	546,293	.....
Coal	tons	852,934	.....

		Quantities	Values
Flour, wheat	pounds	92,355,466	.....
Ginseng	pounds	347,397	.....
Grass cloth	.....	.....	$1,435,148
Groundnuts	pounds	15,815,562	.....
Hides	pounds	1,977,444	.....
Iron, pig	pounds	83,277,091	.....
Manure, ammonia	pounds	17,572,093	.....
Oil—			
Bean	pounds	242,359,649	.....
Castor	pounds	4,138,029	.....
Groundnut	pounds	4,153,590	.....
Salt	pounds	181,107,829	.....
Seed—			
Castor	pounds	5,630,954	.....
Hemp	pounds	29,447,397	.....
Linseed	pounds	3,936,002	.....
Melon	pounds	22,481,059	.....
Perilla	pounds	52,508,400	.....
Sesamum	pounds	39,232,739	.....
Silk—			
Raw, wild	pounds	314,827,625	.....
Cocoons	pounds	194,793,245	.....
Waste	pounds	87,973,245	.....
Pongees	pounds	10,401,644	.....
Skins and furs	pieces	321,271	.....
Tobacco, leaf	pounds	21,280,000	.....
Wool, sheep's	pounds	1,493,723	.....

Trade with the United States—A very considerable part of the overseas trade of this rapidly developing country is with the United States, because it is to America that the builders of Manchurian industries have turned for modern machinery and railway materials.

American manufacturers have found an open door in Manchuria for their products, and the return tide of Pacific traffic has brought to the United States an increasing flow of the products of the rich soil of Manchuria.

The South Manchuria Railway has purchased in the United States $50,000,000 worth of locomotives, cars, rails and other materials, and the industries developed by it in the railway zone have imported $25,000,000 worth of machinery and materials. In contrast to this open door for American products in Manchuria the *Far Eastern Review* stated that railways in neighboring provinces of China had purchased $67,500,000 of materials in Europe, but none in America.

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The famous South Manchuria Railway Express, the only train in the Orient with all-American equipment

Travel through Manchuria affords magnificent views of mountain scenery

The great steel bridge across the Yalu River at Antung, connecting the South Manchuria Railway and the Chosen State Railways

Chinese farmers fording the river at Penhsihu

South Manchuria Railway bridge at Chiaotou

Yei-an bridge at Fushun, South Manchuria Railway

This spic-and-span railway station is at Kungchuling

South Manchuria Railway yard, Dairen

Manchuria, as its latent resources continue to be developed by modern engineering and agriculture, will offer greater and greater opportunities to American trade.

The record of Manchuria's trade with the United States for the past few years is as follows:

	Imports from United States	Exports to United States
1910	$1,212,582	$8,671
1911	1,300,169	20,400
1912	1,444,318	4,493
1913	1,689,215	88,629
1914	3,401,336	479,972
1915	1,784,305	280,492
1916	1,673,092	1,724,091
1917	6,293,941	16,399,301
1918	15,323,807	35,766,620
1919	27,678,116	14,474,853
1920	15,871,554	16,514,377

(2) Facilities for Commerce.

Railways—More than 2200 miles of railway are now in operation in Manchuria. These lines are as follows:

South Manchuria Railway—686 Miles

	Mileage
South Manchuria Railway, Main Line, Dairen-Changchun	439
Mukden-Antung Line, Suchiatun-Antung	162
Ryojun (Port Arthur Branch, Chouchuitzu-Ryojun)	29
Fushun Branch, Hunho-Fushun	33
Yingkou Branch, Tashihchiao-Yingkou	14
Yentai Colliery Branch, Yentai-Yentai Colliery	9

Chinese Government Railways—522 Miles

	Mileage
Kirin-Changchun Line, Changchun-Kirin	79
Ssupingkai-Taonan Line, Ssupingkai-Paiyintailai	125
Part of Peking-Mukden Line, Mukden-Shanhaikwan	261
Yingkou Branch Line, Yingkou-Koupantzu	57

Railways Under Russo-Chinese Management—1,078 Miles

Chinese Eastern Railway—	Mileage
(Western Section) Manchouli-Harbin	584
(Eastern Section) Harbin-Pogranichnaya	341
(Southern Section) Harbin-Kwanchengtzu	148
Jalainor Colliery Branch Line	5

When the Kirin-Huining Railway, together with five proposed railways in South Manchuria and Inner Mongolia are completed and opened for operation, 1500 additional miles of line will be added to Manchuria's transportation facilities.

Waterways—The navigable rivers in Manchuria and Mongolia are the Liao in the south, the Yalu in the east, and the Sungari and the Amur in the north. The Sungari and the Amur admit of the greatest exploitation. Before the railway was built, the Liao served as the only highway of trade in South Manchuria, but now its old glory has vanished. Some 1500 junks are in operation on the Liao and the river is still a trade channel of importance to interior Mongolia. The Yalu and Liao Rivers remain ice-bound from December to March, while the ice-bound period on the Sungari and the Amur extends from November to April.

Ocean steamship services—With the rise of the port of Dairen to second place among all the ports on the China coast, and the development of the harbor facilities for berthing ocean steamships and handling freight, shipping offices of all the shipping companies with Pacific routes have been established at Dairen. The "Commercial Handbook of China," published by the Bureau of Foreign and Domestic Commerce, Washington, gives the following summary of the steamship services at Darien:

> The steamship lines with ocean-going vessels calling regularly at Dairen are as follows:
>
> Osaka Shosen Kaisha: Dairen-Kobe (via Moji); twice a week; four vessels. Dairen-Nagasaki (via Korean ports); monthly; one vessel. Tientsin-Takao, Formosa (via Dairen and Chinese ports); thrice a month; three vessels.
>
> Nippon Yusen Kaisha: Yingkou-Yokohama (via Dairen, Tientsin, Chemulpo, Kobe); thrice a month; three vessels.

South Manchuria Railway Company: Dairen-Shanghai (via Tsingtau); twice a week; two vessels.

In addition to the services listed above, passenger and freight vessels from the following lines occasionally call at the port: Ocean Steamship Co., China Navigation Co., Indo-China Steam Navigation Co., Glen Line, Shire Line, Royal Mail Steam Packet Co., Indra Line and Bucknail Steamship Co.

As will be noticed, there are no American steamship lines represented in the above lists. It is therefore necessary for the American shipper to send his cargo to Yokohama or Kobe and have it transshipped there to one of the Japanese lines to be forwarded to Dairen, unless, of course, a full cargo can be made up and sent directly to Dairen by a tramp steamer.

Steamship lines now operating to Dairen—The following steamship lines are now operating to Dairen:

Toyo Kisen Kaisha: Dairen-San Francisco, via Yokohama, Hongkong and Honolulu; two sailings per month.

Osaka Shosen Kaisha: Dairen-Osaka, via Moji and Kobe; two sailings per week. Seattle, Tacoma via Kobe; three steamers; stop at Dairen on eastbound voyage. New York via Panama; three steamers; stop at Dairen on eastbound voyage. European line via Suez; two steamers; stop at Dairen on outward voyage.

Nippon Yusen Kaisha: Osaka-Newchwang via Kobe and Dairen; sailing every nine days. Service suspended during winter months.

Yokohama-North China Line (Dairen-Seattle); three steamers. Stops at Dairen on eastbound voyage.

Dairen Kisen Kaisha: Tientsin-Dairen-Tsingtao-Shanghai; two sailings per month.

Chosen Yusen Kaisha: Dairen-Tsingtao-Chemulpo; three sailings per month.

To-wa Kisen Kaisha: Dairen-Lungkow; three sailings per month.

Chingkee Steamship Company: Dairen-Chefoo; twelve sailings per month.

Awakyodo Kisen Kaisha: Dairen-Tsingtao. Dairen-Chemulpo.

Norton Lilly Company, 26 Beaver Street, N. Y. C.: General agents for companies having steamers leaving Atlantic Coast Ports for Dairen.

Barber Steamship Lines, 17 Battery Place, N. Y. C.: Have steamers leaving Atlantic Coast Ports for Dairen.

Posts, telegraphs and telephones—Along the line of the South Manchuria Railway, postal, telegraph and tele-

phone systems are organized and operated by the Japanese authorities. More than 700 miles of telegraph lines and 1,000 miles of telephone lines (the two services using more than 20,000 miles of wires) have been installed. Chinese post-offices are maintained in all towns outside Kwantung, in which territory the postal service is operated by the Kwantung Government. Communication facilites are constantly being improved and expanded.

Warehousing—A number of warehousing and forwarding companies are in operation in the principal towns along the South Manchuria Railway. The railway maintains warehouses and storage yards at the Dairen wharves and at the principal railway stations.

Insurance—Branches of the leading Japanese, English and American insurance companies are maintained at Dairen. At the end of 1919 there were 61 insurance offices in Kwangtung Territory, 130 in the South Manchuria Railway Zone, and 93 outside of the zone. The total amount of insurance in force was 666,800,000 yen. Freight at the Dairen wharves is insured by the railway company, by arrangement with a number of insurance companies, and this insurance is voluntarily effected by the South Manchuria Railway without charge to the owners of the goods.

Banking—Manchuria has adequate, modern banking facilities, the great Japanese and foreign institutions maintaining branches in Dairen and other cities. In addition there are a number of local institutions. The Japanese banks maintain twenty-six main offices and sixty branch offices, while the Chinese banks have eleven main offices and seventy branch offices.

The Bank of Chosen ($25,000,000 paid-up capital) and the Yokohama Specie Bank ($50,000,000 paid-up

capital) are the largest institutions maintaining branches in Manchuria. They have built imposing banking houses in Dairen, which are among the most beautiful structures facing the plaza. The principal banks in Manchuria are as follows:

		Authorized Capital
Japanese		
Bank of Chosen	yen	80,000,000
Yokohama Specie Bank	yen	100,000,000
Chenlung Bank	yen	20,000,000
Dairen Bank	yen	3,000,000
Liaotung Bank	yen	3,000,000
Lungkow Bank	yen	11,000,000
Dairen Commercial Bank	yen	2,275,000
Chinese		
Bank of China	yuan	60,000,000
Bank of Communication	tael	15,000,000
Three-Eastern Provincial Bank	yuan	600,000
Mukden Industrial Bank	yuan	13,000,000
Kirin Provincial Bank	tiaos	1,500,000
Heilungkiang Provincial Bank	tael	404,998
Frontier Development or Territorial Bank	silver yen	2,000,000
Foreign		
Russo-Asiatic Bank	rubles	55,000,000
Hong Kong & Shanghai Banking Corporation	silver yen	20,000,000
International Banking Corporation		$10,000,000
Chinese-French Commercial Bank	francs	45,000,000

Currency—As in other parts of China, there are many kinds of currency in circulation.

The foreign bank-notes exert a great influence, and it is mainly through them that the foreign trade of the country is actually carried on. These bank-notes circulate in large amount, and within the limits of the Leased Territory and the Railway Zone are practically the sole currency. It should be noted, however, that, outside these limited places, their circulation is greatly modified, because, though they are used very extensively and freely for all trading purposes, mutual transactions between the natives are carried on in native currency.

The "Economic History of Manchuria" gives the following table of monies in circulation in Manchuria:

- Chinese currency
  - Coins: Cash (*chuhchien*), Copper coin (*tungyuan*), Silver dollar (*yangchien*), Sycee (*yinting*).
  - Notes: Government notes (*kuantieh*), Copper coin notes (*tungyuanpiao*), Silver dollar notes (*yangchienpiao*).
- Foreign currency
  - Coins: Japanese silver yen, Mexican dollar, Japanese and Russian subsidiary coins.
  - Notes: Japanese military notes, Bank of Japan notes, Bank of Chosen notes, Yokohama Specie Bank notes, Russian ruble notes.

Trade organizations—Chambers of commerce are maintained at Dairen, Mukden, Antung, Changchun, Yingkou and other cities. At every trade center there is a Chinese guild. The Dairen organization publishes periodical reports on the trade and industry of Manchuria.

The Dairen Produce Exchange was established in 1913; in 1915, a produce and currency exchange was opened at Kaiyuan, and another at Changchun in 1916. In 1917, a currency exchange was established in the Dairen Produce Exchange, and now the produce and currency exchanges are known as the Dairen Exchange. In 1919, produce and currency exchanges were opened at Kungchuling, Ssupingkai and Tiehling, and in 1920, at Mukden, Yingkou and Liaoyang. In addition stock and merchandise exchanges have been founded at Dairen, Mukden and Antung under private management.

On these exchanges there is trading in beans, bean cake, kaoliang, bean oil, wheat, Italian millet, etc., gold notes issued by the Bank of Chosen, Russian ruble notes, silver

notes issued by the Yokohama Specie Bank, Chinese small silver coins, and Chinese small silver coin notes. In Manchuria, owing to the great variety of currencies in circulation and more particularly because of the constant fluctutations in their exchange rates, the currencies have come to be looked upon as commodities. Because of this peculiar feature in the currency situation in South Manchuria, the exchanges are under Government management; and in order to guarantee delivery and to settle accounts between sellers and buyers, a trust and guaranty company under private management is attached to each exchange.

For the purpose of providing long-term capital to develop the country, there have been organized the Oriental Developing Company, the Eastern Enterprise Company and the Manchurian Enterprise Company. These financial institutions make loans against lands and buildings.

A commercial museum was established in Tiehling in 1906. Similar institutions were opened later in Changchung, Antung and Harbin. The Kwangtung Government recently established in Port Arthur the Manchuria-Mongolia Production Museum.

V. THE SOUTH MANCHURIA RAILWAY AND ITS WORK

(1) A Modern Railway in an Ancient Land

The Treaty of Portsmouth—From Portsmouth, New Hampshire, to Manchuria, is a far cry. Yet in the matter of the South Manchuria Railway Company there is an important association between them. In 1905 the Peace Treaty between Russia and Japan was signed at Portsmouth. By this Treaty the southern portion of a great railway running through Manchuria from Changchun southward to the port of Dairen, and originally the property of Russia, was transferred to Japan. In 1906, by Imperial ordinance, the South Manchuria Railway Company was founded and the railway properties were taken over.

Since then the South Manchuria Railway has opened up the richest portion of China, heretofore undeveloped, and has made it a dominating factor in industrial and commercial enterprises, as well as an inviting country for the world-traveler. Today, Manchuria has better railroad facilities than any other part of China.

Western civilization in the East—The South Manchuria Railway has not been content to develop merely the material resources of the rich territory it serves; it has bent its energies to the spread of modern civilization in this ancient land of the Manchus. To accomplish this, it

At Mukden, the American Consulate is situated in an old Chinese Temple, selected for this purpose by Mr. Willard Straight

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Yamato Hotel at Port Arthur

Yamato Hotel at Changchun

Yokohama Specie Bank, Dairen

Bank of Chosen, Dairen

Cargo junks and fishing boats at Dairen

has built cities and administers them; it operates coal mines, steel works, waterworks, electric and gas plants, and a chain of hotels; and maintains schools, hospitals, laboratories and experiment stations.

Along the line of the railway there have sprung up modern cities. These settlements within the railway zone, built and administered by the officers of the South Manchuria Railway Company, are amazingly like new western towns in the United States. They are enterprising, modern, beautifully laid out, and afford every educational, sanitary, civic and industrial advantage. These settlements often lie in close proximity to old Manchu cities, and indeed form part of them.

This railroad uses an all-American equipment of locomotives, coaches and rails. The shriek of these American locomotives across Manchurian plains and through Manchurian cities is the voice of modern enterprise bringing a rich, modern life, opportunity, hygiene, education and happiness to an ancient people.

Some writers have compared this great railway company, with its varied transportation, agricultural, industrial and civic interests to the famous trade adventuring companies of 300 years ago. But a Japanese writer, in the "Economic History of Manchuria," points out that the South Manchuria Railway Company is a very different kind of venture. He says:

"Of the nature of the company, the author has heard people compare it, not so often nowadays as at the time of its establishment—and take delight in so comparing it—with the East India companies established by England, Holland, France, and other European countries in the course of the 17th and 18th centuries. But nothing is further from the truth. Those East India companies,

ostensibly trading corporations, were in fact political organizations with even military powers conferred upon them by their respective Governments, whereas the South Manchuria Railway Company is an economic institution, pure and simple, in both name and reality. It has no hand even in the policing of its own railway zone, and has no power whatever over the soldiery stationed in Manchuria.* Nor is there anything, even in its economic rights, that bears a semblance of the sole right of trading with the East Indies. The difference is too clear to need further comment. That it was modelled to a great extent after the Chinese Eastern Railway Company there seems little doubt. Indeed, it could not be otherwise, since in many respects the company is nothing but the successor in South Manchuria of that Russian company. But in the organization of the South Manchuria Railway Company there is nothing of the vagueness that enshrouded that of the Russian company. It was established by a special charter of the Government, but essentially as a joint-stock company organized according to the commercial law of Japan."

Activities of the company—The principal enterprises of the South Manchuria Railway Company are these:

Railways—The company owns and operates 686 miles of railway lines in South Manchuria, and also operates the Chosen State Railways with a mileage of 1153. The railway properties include modern car shops and locomotive repair shops, modern terminals and an extensive system of warehouses on the seacoast and along the lines.

Shipping—An ocean service between Dairen and Shanghai. (Sold to Dairen Steamship Co.)

*A military and police guard are maintained by the Kwautung Government along the railway zone for protection against robbers.—*Editor's Note.*

Harbors—Docks, wharves and warehouses at Dairen, Yingkou, Antung and Shanghai. Dairen has been made the best equipped harbor in the Far East, with a capacity of docking at one time fifty vessels of 85,000 tons.

Coal mines—Bituminous mines at Fushun and Yentai, equipped with modern American equipment, and with reserves of 1,200,000,000 tons.

Steel works—A modern steel plant at Anshan, with an ultimate annual capacity of 1,000,000 tons of steel, to utilize the ore of the Anshan mines, the reserves of which are estimated at several hundred million tons.

Electricity and gas—Electric light and power plants in Dairen, Antung, Fushun, Mukden and Changchun, and electric street railways in Dairen and Fushun, the total annual output reaching 20,000,000 kilowatts; a large gas plant in Dairen, with a production of 215,000,000 cubic feet a year, and a smaller plant at Anshan.

Hotels—A chain of modern hotels along the line of the railway, including Dairen, Port Arthur, Mukden, Changchun and the seaside resorts, Hoshigaura and Ogondai.

Research bureaus—The Central Laboratory in Dairen is charged with the study of the utilization of agricultural and other products, and the study of public health problems. The Geological Institute in Dairen makes mineral and soil surveys and analyses. Agricultural Experiment Stations are operated at Kungchuling and Hsiungyocheng, and in addition there are sixteen nurseries, and experimental farms at Telissu and Chengchiatan.

Civic planning and administration—Under direction of the Japanese Government, the railway undertakes town planning, organizes sanitation, conducts schools and hospitals and lends its aid to civic betterment work.

Financing a great enterprise—The capital expenditures made by the South Manchuria Railway in the various enterprises in which it is engaged are shown in the table below. For the fifteen years ending March 31, 1922, these investments, including the appraised value of the properties taken over by the company in 1906, totalled 474,000,000 yen ($237,000,000). When it is considered that the greater part of this amount was expended at prewar prices for labor and materials, and in a country where wage rates are only a fraction of those prevailing in the United States, it can be estimated that this property investment of $237,000,000 is easily equivalent to an expenditure of several times that amount in America or Europe today.

Including the value of the properties taken over in 1907, appraised at 92,780,978 yen, the total investment at the end of the fiscal year 1920-21 and the proportion of the total investment in each department, was as follows:

	Yen	Percentage
Railways	166,225,463	38.6
Mines	94,076,277	21.8
Buildings	37,648,697	8.7
Steel Works	32,647,334	7.6
Harbors	30,692,418	7.1
Lands	18,752,159	4.4
Industries	11,580,678	2.7
Local Institutions	11,347,116	2.6
Electricity	10,303,118	2.4
Workshops	9,795,220	2.3
Gas	2,949,984	.7
Steamships	2,392,002	.6
Hotels	2,280,832	.5
Total	430,691,247	100.0

The record of capital expenditures since 1906 follows:

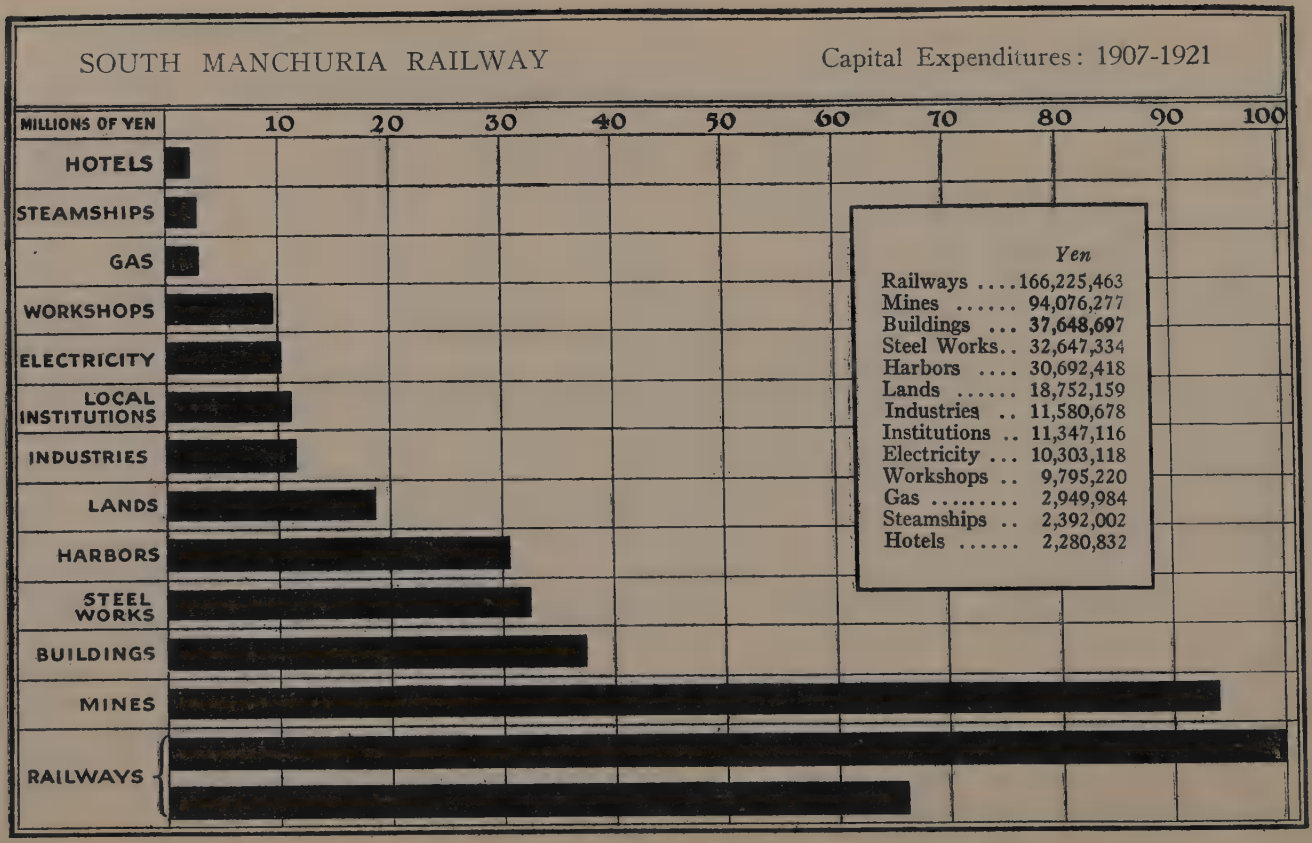
Original investment by Japanese Government	Railways Yen	Workshops Yen	Steamships Yen	Harbors Yen	Mines Yen	Steel Works Yen
	25,719,896	332,216	.....	6,209,134	46,013,892	.....
1907	9,464,713	691,046	.....	523,310	665,108	.....
1908	22,145,348	336,873	.....	1,582,730	2,832,629	.....
1909	8,276,670	867,889	.....	1,610,788	1,989,976	.....
1910	14,096,718	2,444,648	.....	2,616,619	2,120,071	.....
1911	11,809,955	1,342,432	2,812,434	682,662	1,389,058	.....
1912	4,506,378	232,229	572,923	1,645,684	1,501,751	.....
1913	1,962,590	149,708	1,507,279	2,304,183	1,748,556	.....
1914	1,235,928	196,394	77,799	1,629,919	2,795,049	.....
1915	693,911	154,749	79,277	1,267,184	2,449,553	.....
1916	1,769,775	370,139	-1,905,679*	1,781,132	-21,448*	.....
1917	2,621,613	650,275	-463,717*	2,337,646	2,873,131	4,447,760
1918	5,407,393	532,324	-156,448*	2,573,464	4,209,561	4,900,572
1919	25,893,469	903,900	-145,461*	3,575,641	8,318,659	28,342,328
1920	34,167,049	789,627	13,596	443,930	15,473,638	-5,043,327*
Total	166,225,463	9,795,220	2,392,002	30,692,418	94,076,277	32,647,334

Original investment by Japanese Government.	Electricity, Gas, etc. Yen	Hotels Yen	Local Institutions Yen	Lands Yen	Buildings Yen	Total Yen
	367,232	13,539	313,441	6,043,944	7,770,685	92,780,978
1907	112,709	202,764	341,812	.....	2,047,296	14,048,758
1908	887,887	25,078	-7,531*	2,279,310	2,396,329	32,478,657
1909	2,435,202	404,375	587,765	945,597	776,175	17,894,437
1910	1,259,745	317,278	505,497	1,961,024	2,170,152	27,491,750
1911	861,124	125,178	704,231	2,162,387	1,654,319	23,543,780
1912	683,571	253,894	487,923	1,056,498	655,251	11,596,102
1913	-196,472*	288,657	1,397,241	1,367,059	851,675	11,380,478
1914	256,343	399,656	723,864	850,113	989,961	9,155,026
1915	155,741	16,168	-205,612*	221,235	185,245	5,017,451
1916	2,628,032	11,288	866,472	517,135	270,951	6,287,797
1917	2,873,101	17,131	1,200,364	218,395	869,534	17,645,233
1918	2,865,094	61,950	1,032,856	455,559	1,112,506	22,994,842
1919	4,424,632	93,728	1,643,742	2,819,646	6,128,403	81,998,687
1920	5,233,928	50,147	1,781,259	-1,975,183*	10,400,390	61,335,053
Total	23,048,322	2,280,832	11,347,116	18,752,159	37,648,697	430,691,247

(2) The Railway

Road and equipment—Originally built by the Russians in 1900-01, what is now known as the South Manchuria Railway was a cheaply-constructed, poorly-equipped rail-

* Decreases in capital expenditures are the result of sales of property to other companies, transfers from one department to another, and depreciation written off.


SOUTH MANCHURIA RAILWAY
Capital Expenditures: 1907-1921
MILLIONS OF YEN
10
20
30
40
50
60
70
80
90
100
HOTELS
STEAMSHIPS
GAS
WORKSHOPS
ELECTRICITY
LOCAL INSTITUTIONS
INDUSTRIES
LANDS
HARBORS
STEEL WORKS
BUILDINGS
MINES
RAILWAYS
Yen
Railways 166,225,463
Mines 94,076,277
Buildings ... 37,648,697
Steel Works.. 32,647,334
Harbors 30,692,418
Lands 18,752,159
Industries .. 11,580,678
Institutions .. 11,347,116
Electricity ... 10,303,118
Workshops .. 9,795,220
Gas 2,949,984
Steamships .. 2,392,002
Hotels 2,280,832

way, of strategic military value, but absolutely inadequate for the commercial development of a growing country. The main line from Port Arthur on the Yellow Sea northward to Changchun (436 miles) was originally constructed by the Russians on the Russion 5-foot gauge. During the Russo-Japanese War, the field railroad division of the Japanese Army reconstructed this road as a narrow-gauge military line, and the Japanese Army also built a narrow-gauge line northward from Antung during the advance on Mukden.

The South Manchuria Railway Company, when it acquired these lines, immediately began a comprehensive program of reconstruction. The lines were rebuilt and double-tracked on the standard gauge used in America; curves were straightened, grades were reduced by the rebuilding of roadbeds and the construction of tunnels; modern steel bridges were thrown across the rivers; heavy rails, locomotives, freight and passenger cars were brought from the United States; the number of stations was increased from 54 to 114; modern station buildings were built at all important points, and new workshops, roundhouses and warehouses were installed; in a word, a standard American railway was constructed in place of the old Russian line.

In the rebuilding of the Mukden-Antung line, for exemple, $12,000,000 was expended. In this work the most difficult pieces of engineering were the excavation of the tunnels piercing Fuchinling, 4,884 feet in length, and the Chikuanshan, 3,254 feet in length, and the bridge over the River Taitze, 1,779 feet in length. This whole work, inclusive of 24 tunnels, 205 bridges and 213 culverts, was completed in twenty-six months. The work was carried on uninterruptedly through severe winter weather and the heavy rain storms of summer.

The equipment consists of 340 locomotives, including nearly all the types familar on American roads; 5,624 freight cars, including 2,224 box cars, 2,374 flat cars, and a full equipment of coal, ore, sand, oil-tank, water-tank, refrigerator and caboose cars; and 328 passenger cars, including compartment Pullmans and American dining cars for the express trains. The South Manchuria Express, an excess-fare through train, which makes the 436-mile run from Dairen to Changchun in 15 hours, has been called the "20th Century Limited of the Far East." On this de-luxe train, the first- and second-class sleeping cars are all compartments. Through service between Europe and Dairen, via the Trans-Siberian route, was inaugurated in 1908, but had to be suspended when the war came.

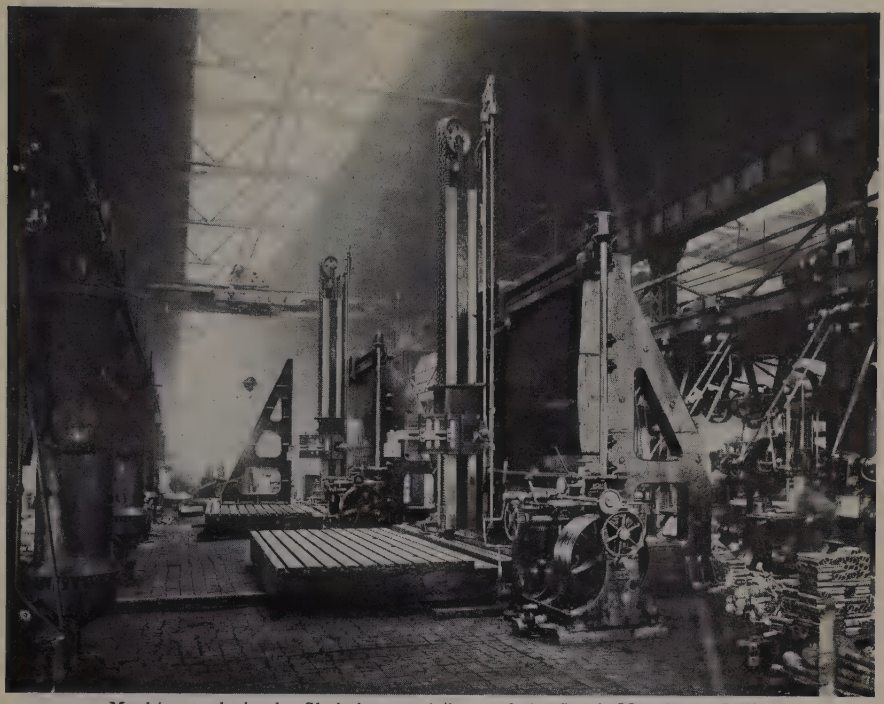
Railway shops—The new car and locomotive shops at Shakakou, near Dairen, are among the largest and best equipped in the Orient, and have their own waterworks. The area comprises about 230 acres, of which about 11 acres are covered with offices and workshops. The shops have a capacity of simultaneously executing repairs on 27 locomotives, 36 passenger cars, and 130 freight cars. Of the rolling stock now in use by the company, 6 locomotives, 25 passenger cars and 461 freight cars were constructed at these shops. Orders from the Chosen State Railways and the Chinese Government Railways have also been filled. Adjoining the workshops is a village for the employees, containing about 700 houses covering a little more than six acres, which is undoubtedly one of the pleasantest spots in the country around, with finely laid out streets, perfect drainage, waterworks, etc., and provided with a primary school, a hospital, a post office, a church, a temple, a shrine and some provision stores. Repair shops are also located at Liaoyang. At Suchiatun there is a plant for creosoting railway ties.

Head Office of the South Manchuria Railway Company at Dairen

Angler's Hill on the Antung - Mukden branch

Pullman sleeping car, South Manchuria Railway

American dining-car on the South Manchuria Railway



Machine tools in the Shakakou workshops of the South Manchuria Railway

Passenger car shop at the Shakakou workshops

As Mukden Station looked when the Russians operated the South Manchuria Railway

Mukden Station today with the modern station building and the Yamato Hotel combined

Railway finance—When the South Manchuria Railway Company took over the old Russian properties it had an authorized capital of 200,000,000 yen, half of which was subscribed by the Japanese Government, and the other half by Japanese and Chinese investors. The first stock issue of 20,000,000 yen was over-subscribed 1066 times, an indication of the enthusiasm with which the Japanese embarked on this Manchurian venture. The Japanese Government had invited the Chinese Government to join in the enterprise, but this offer was not accepted. When the shares were offered to the Japanese public there was no idea that the enterprise would be so profitable, and the great success of the offering was entirely due to the patriotic enthusiasm of the people to back the Government in the undertaking. In 1920 the authorized capital was increased to 440,000,000 yen ($220,000,000). In addition to the share capital, the company has floated several issues of debentures in Europe and Japan, and the amount of these outstanding March 31, 1921, was 145,000,000 yen. The largest issues have been sterling loans in the London market, £6,000,000 of 5 per cents, and £6,000,000 of 4½ per cents. The Japanese Government has since taken over these foreign loans. Of the 440,000,000 yen share capital, 220,000,000 yen has been allotted for public subscription and an equal amount for Government subscription. Of the public shares, 160,000,000 yen have been subscribed, and 92,000,000 yen of these subscriptions have been called for. Of the Government shares, 100,000,000 yen represent the value of the original property turned into the company by the Japanese Government and the balance (120,000,000 yen) represents the amount of London sterling debentures taken by the Government.

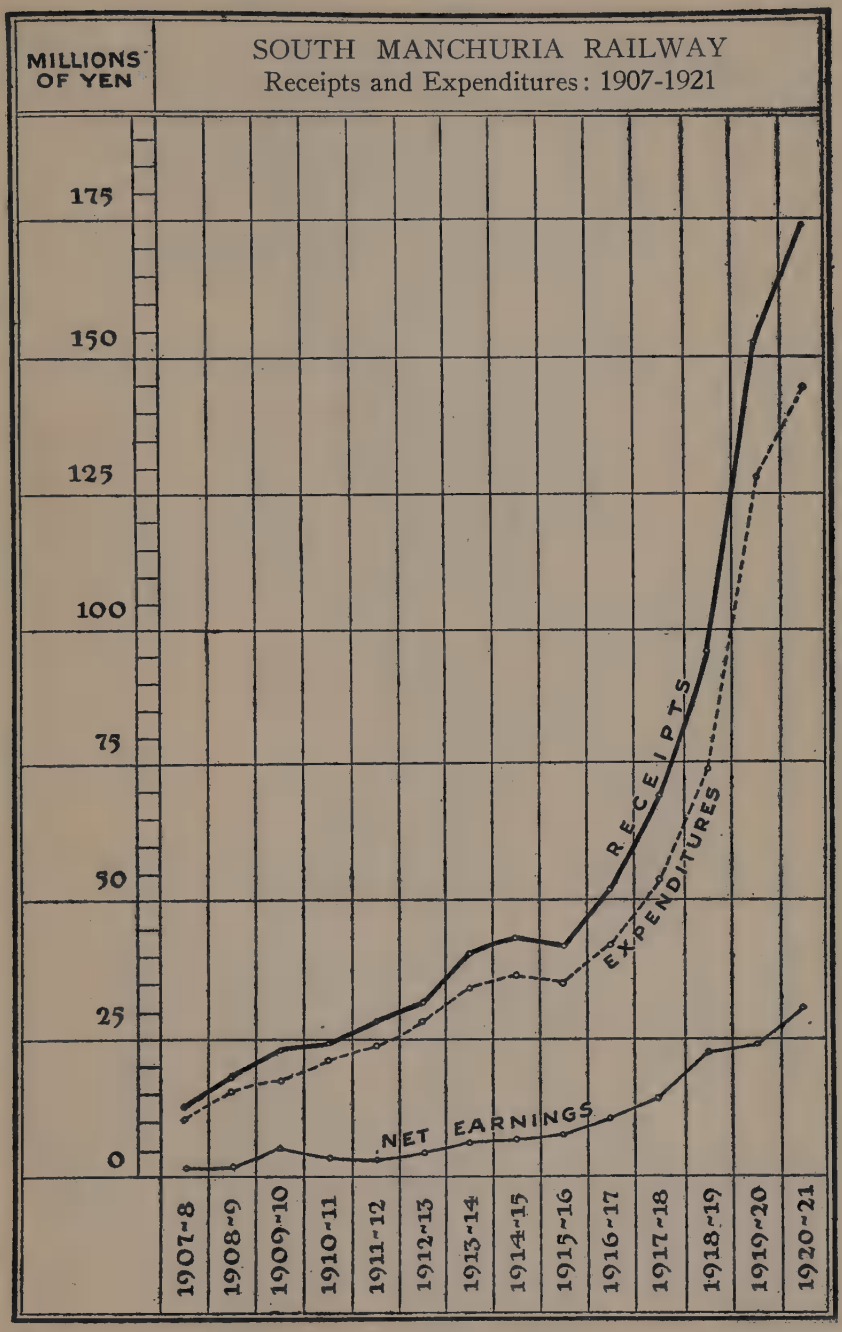
While the actual expenditures on capital account are put down at 474,000,000 yen, the estimated value of all the properties owned by the company, including the coal and iron deposits, is 1,400,000,000 yen ($700,000,000).

The general balance sheet on March 31, 1922, was as follows:

Assets	Yen	Liabilities	Yen
Unpaid Share Capital	70,844,000	Capital subscribed	380,000,000
Expenditure on Capital Account	474,443,768	Reserve prescribed by Law	7,222,000
Products in Stock, including Coal and other Minerals	10,109,776	Special Reserve	38,400,000
Stores	31,957,222	Debentures Redemption Fund	21,000,000
Negotiable Documents, including Shares in other Companies and others.	12,857,001	Debentures	175,000,000
Foreign Coins	10,585	Stock Reserve	721,513
Cash in Hand	220,591	Accounts with other Houses	395,594
Stamps, Postals & Revenue	23,921	Guarantee Money	1,198,698
Deposits	40,960,797	Collateral Securities	1,500
Loans	39,623,962	Transfer Account	50,079
Accounts with other Houses	425,106	Compulsory Guarantee deposits of the Company's Employees	11,983,267
Collateral Securities	3,657	Savings deposits of Company's Employees	4,327,303
Sundry Debtors	1,204,460	Mutual Relief Society Reserve	2,819,475
Transfer Account	155,562	Sundry Creditors	33,120,215
Uncollected Credits	14,458,001	Receipts on Suspense Account	5,636,662
Payments on Suspense Account	16,004,808	Balance brought forward from last Term	7,187,601
Expenditure on Engineering Account	546,278	Balance for the Term	31,386,138
Expenditure on Workshop Account	1,661,031		
Discount on Debenture Issue, less amount written off	4,939,518		
	720,450,052		720,450,052

Dividends on the publicly held shares are guaranteed at 6 per cent by the Japanese Government, but the success of the enterprise has enabled the company to increase the dividend gradually to 10 per cent. The government shares in the profits after the payment of all charges and the 6 per cent dividend on the public shares. The government is now receiving 4.3 per cent on its holdings.

A number of the enterprises of the company are conducted at a loss or a nominal profit, because they are of


MILLIONS OF YEN
SOUTH MANCHURIA RAILWAY
Receipts and Expenditures: 1907-1921
175
150
125
100
75
50
25
0
RECEIPTS
EXPENDITURES
NET EARNINGS
1907-8
1908-9
1909-10
1910-11
1911-12
1912-13
1913-14
1914-15
1915-16
1916-17
1917-18
1918-19
1919-20
1920-21

public benefit or develop traffic for the railway. The expenditures for local administration in 1921-22, for example, were more than $5,000,000 and the receipts were less than $2,000,000. The profitable operation of the railway itself enables the company to devote capital to the development of the country. The receipts and expenditures of the various enterprises is shown in the following account for 1921-22:

Expenditures	Yen	Receipts	Yen
Railways	33,172,716	Railways	78,204,132
Steamers	810,556	Steamers	555,633
Harbors	6,911,904	Harbors	7,580,559
Mining	36,708,108	Mining	40,004,029
Iron Manufacture	6,480,725	Iron Manufacture	3,606,999
Electricity	3,483,511	Electricity	4,297,282
Gas	537,501	Gas	827,421
Hotels	1,305,092	Hotels	1,085,933
Local Administration	10,386,002	Local Administration	3,954,463
Interest on Debentures, Loans and Deposits	13,267,848	Interest on Invested Funds	3,819,490
Sundry Losses	465,974	Sundry Profits	2,861,439
Writing off Discount on Debenture Issue	2,184,621	Profit from Chosen Line	303,217
	115,714,463		
Balance for the Term	31,386,138		
	147,100,602		147,100,602

The growth in earnings is shown in the following table:

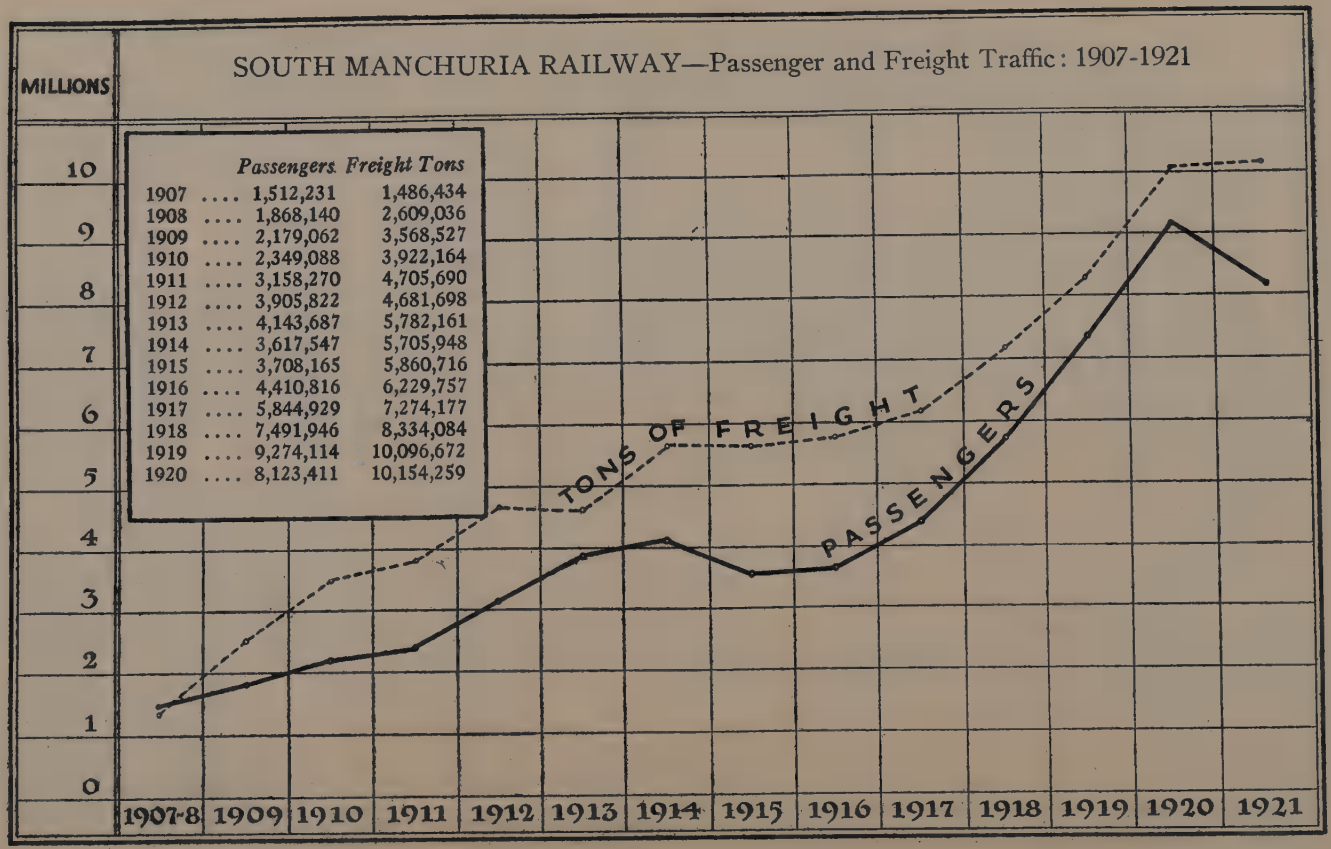
	Receipts Yen	Expenditures Yen	Net Profit Yen
1907-8	12,543,116	10,526,531	2,016,585
1908-9	17,615,683	15,502,101	2,113,582
1909-10	23,113,933	17,342,234	5,771,699
1910-11	24,777,684	21,069,368	3,708,316
1911-12	28,155,080	24,487,652	3,667,428
1912-13	33,546,477	28,620,432	4,962,045
1913-14	42,417,123	35,249,844	7,167,279
1914-15	44,670,616	37,129,525	7,541,091
1915-16	43,786,025	35,705,526	8,080,499
1916-17	52,402,408	42,294,801	10,107,607
1917-18	69,429,252	54,503,610	14,925,643
1918-19	96,257,877	74,064,706	22,193,171
1919-20	153,133,387	128,758,422	24,374,964
1920-21	174,738,287	147,346,302	27,391,984
1921-22	147,100,602	115,714,463	31,386,138

Railway traffic—The number of passengers carried by the South Manchuria Railway has increased about six-fold, and the tons of freight hauled about seven-fold. The freight tonnage passed the 10,000,000 mark in 1919-20. These traffic figures for the past fourteen years are shown here:

	Passengers	Tons of Freight
1907-8	1,512,231	1,486,434
1908-9	1,868,140	2,609,036
1909-10	2,179,062	3,568,527
1910-11	2,349,088	3,922,164
1911-12	3,158,270	4,705,690
1912-13	3,905,822	4,681,698
1913-14	4,143,687	5,782,161
1914-15	3,617,547	5,705,948
1915-16	3,708,165	5,860,716
1916-17	4,410,816	6,229,757
1917-18	5,844,929	7,274,177
1918-19	7,491,496	8,334,084
1919-20	9,274,114	10,096,672
1920-21	8,123,411	10,154,259

A more accurate measure of the remarkable growth in traffic is to be had in the record of passengers carried one mile and tons of freight carried one mile, shown in the following table:

	Passenger Miles	Ton Miles
1907-8	140,753,513	271,730,499
1908-9	136,837,913	513,316,086
1909-10	154,032,778	628,631,101
1910-11	151,234,501	674,492,481
1911-12	209,535,512	737,802,153
1912-13	253,160,775	895,540,914
1913-14	255,909,094	1,113,606,271
1914-15	221,226,921	1,203,445,614
1915-16	255,261,946	1,148,556,115
1916-17	313,717,726	1,305,970,165
1917-18	401,049,336	1,509,283,963
1918-19	511,176,520	1,725,339,506
1919-20	575,496,292	2,066,858,405
1920-21	526,991,710	2,285,536,887



	Passengers	*Freight Tons*
1907	1,512,231	1,486,434
1908	1,868,140	2,609,036
1909	2,179,062	3,568,527
1910	2,349,088	3,922,164
1911	3,158,270	4,705,690
1912	3,905,822	4,681,698
1913	4,143,687	5,782,161
1914	3,617,547	5,705,948
1915	3,708,165	5,860,716
1916	4,410,816	6,229,757
1917	5,844,929	7,274,177
1918	7,491,946	8,334,084
1919	9,274,114	10,096,672
1920	8,123,411	10,154,259

A comparison of the South Manchuria Railway freight traffic with that handled on some American roads in 1921 is of interest:

	Mileage	Ton-Miles of Freight
South Manchuria Railway	686	2,285,000,000
Central Railroad of New Jersey	679	2,240,000,000
Western Maryland	801	1,785,000,000
Oregon Short Line	2,361	2,412,000,000
New York, New Haven & Hartford	1,215	2,679,000,000

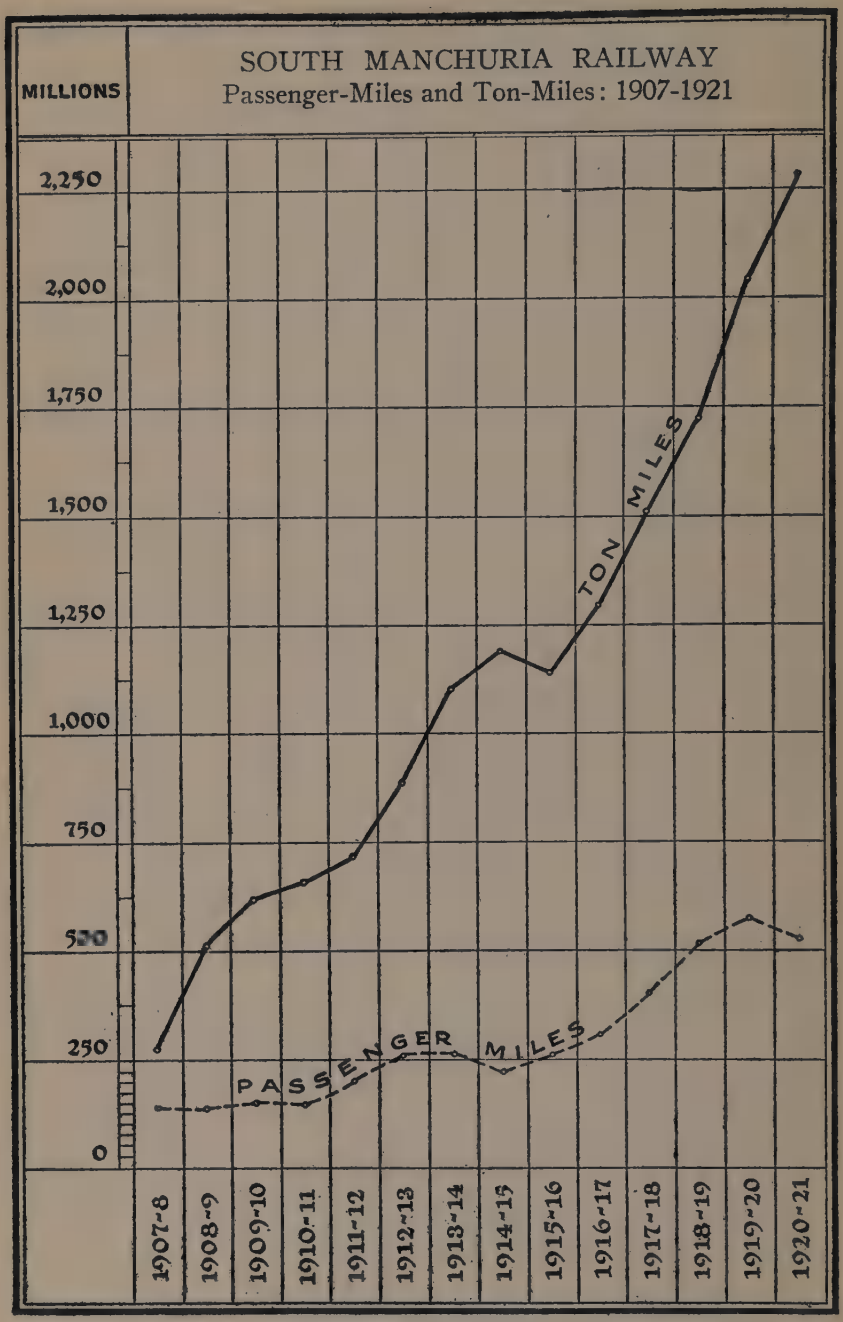
The South Manchuria Railway reports very much larger earnings per mile than other roads in China, as the following figures for 1919 show:

		Receipts Per Mile—1919		
	Mileage	Passenger	Freight	Total
South Manchuria Railway	683	$10,652.71	$34,631.35	$45,284.06
Peking-Hankow Railway	825	6,456.13	18,281.76	24,737.89
Peking-Mukden Railway	606	11,704.53	14,434.97	26,139.50
Tientsin-Pukow Railway	688	7,404.41	7,881.84	15,286.25
Shanghai-Nanking Railway	203	14,361.78	8,730.94	23,092.72

No reports for the Chinese Eastern Railway are available since 1912. At that time its total earnings per mile were only $7,905.18.

The tonnage of the principal commodities carried in 1920-21 was as follows:

	Tons
Coal and coke	3,504,325
Beans	1,861,925
Barley	584,637
Kaoliang	518,217
Bean cake	315,675
Lumber	220,476
Ores	220,038
Flour	191,820
Salt	175,242
Other commodities	2,561,904
Total	10,154,259


SOUTH MANCHURIA RAILWAY
Passenger-Miles and Ton-Miles: 1907-1921
MILLIONS
2,250
2,000
1,750
1,500
1,250
1,000
750
500
250
0
TON MILES
PASSENGER MILES
1907-8
1908-9
1909-10
1910-11
1911-12
1912-13
1913-14
1914-15
1915-16
1916-17
1917-18
1918-19
1919-20
1920-21

Interior of locomotive shops at the Shakakou workshops of the South Manchuria Railway

The plant which supplies Dairen with its illuminating gas

Electric light and power plant, Dairen

Coal storage for Dairen gas works

Railway shops and town, Shakakou

The railway station at Changchun. Victorias, 'rickshas, Peking carts and Russian droskies tell the traveler that this is the "melting pot" of Manchuria

South Manchuria Railway Company Hospital at Mukden. One of the modern hospitals which are doing so much in combatting disease in Manchuria

Railway rates—Passenger rates at present are: first class, 3½ cents a mile; second class, 2¼ cents; third class, 1¼ cents.

The average revenue per ton-mile in 1920-21 was 1.39 cents, which compares with the present American revenue of 1.25 cents per ton-mile, and the English figure of 3.95 cents.

Special reductions in rates are made from time to time to encourage local development and to assist in relief work. During the North China famine in 1920 the company made a 50 per cent reduction in freight rates on supplies moving into the famine area. It carried free thousands of Chinese famine refugees in 1920 and 1921. Also in 1920 the road carried Roumanian and Polish refugees at half rates. Every spring it carries Chinese coolies at half rates. In the spring of 1922 it made a 50 per cent reduction on cereals to Mukden destined to relieve the South China famine. Reductions of from 20 to 25 per cent have been made on building materials and living necessities for new communities. This is the same method of local aid that was successfully followed by the pioneer roads in the American West.

Through routes for passengers and freight have been established in cooperation with the various rail and water lines to Chinese and Japanese ports and inland cities, and to America and Europe. Before the European War a new short through route was established (1908) from Shanghai to Europe, via South Manchuria Railway steamer to Dairen, and South Manchuria Railway northward connecting with the Trans-Siberian. This service will be resumed when normal conditions return in Siberia and Russia. The rebuilding of the line from Mukden to Antung, and the opening of the great bridge across the

Yalu (1911), thus connecting the Manchuria and Chosen lines, established a new world highway between Japan and Europe.

The freight and passenger receipts have grown from less than $5,000,000 a year to more than $40,000,000, and the railway net earnings have reached $26,000,000. The record of earnings is as follows:

	Receipts Yen	Expenditures Yen	Net Railway Revenue Yen
1907-8	9,768,887	6,101,615	3,667,272
1908-9	12,537,142	5,161,408	7,375,735
1909-10	15,016,198	5,818,333	9,197,865
1910-11	15,671,605	6,542,640	9,128,965
1911-12	17,526,288	6,908,354	10,617,934
1912-13	19,907,456	7,846,923	12,060,533
1913-14	22,275,132	7,913,948	14,361,184
1914-15	23,216,722	8,345,286	14,871,435
1915-16	23,532,118	8,174,520	15,357,598
1916-17	27,815,349	8,435,939	19,379,409
1917-18	34,457,923	10,858,734	23,599,189
1918-19	44,992,872	17,038,157	27,954,715
1919-20	67,060,720	30,528,938	36,531,782
1920-21	85,316,806	36,760,264	48,556,542
1921-22	78,204,132	33,172,716	45,031,416

Statistics of operation—The report of the South Manchuria Railway for the year ending March 31, 1921, gives the following significant statistics of operation:

Miles of line	686
Miles of track	1,454
Train-miles	7,257,336
Locomotive-miles	8,783,120
Car-miles	163,316,416
Passengers carried	8,123,411
Passenger-miles	526,991,710
Passenger train earnings	$6,742,435
Passenger train earnings per mile of road	$10,754
Average receipts per passenger-mile (cents)	1.28
Average journey per passenger (miles)	64.9
Average passengers per train	293.3
Tons of freight carried	10,154,259
Ton-miles of freight	2,285,536,887

Freight earnings	$31,933,515
Freight earnings per mile of road	$46,537
Average receipts per ton-mile (cents)	1.39
Average haul per ton	225.1
Average tons per train	437.2
Transportation and traffic expenses	$7,378,975
Maintenance of equipment expenses	$3,075,900
Maintenance of way expenses	$2,665,100
General expenses	$5,160,766
Total railway expenses	$18,280,766
Total railway revenues	$39,263,188
Operating ratio	43.1%
Total receipts from all sources	$42,658,403
Total expenses of all kinds	$18,380,133
Net profit from all sources	24,278,270
Equipment:	
Locomotives	340
Passenger train cars	328
Freight train cars	5,624
Personnel:	
Employees	37,500

Warehouses—The warehousing business was in a very crude state when the company took over the operation of the railway lines, and the railway company undertook the management of all warehousing facilities. There are today 103 railway warehouses at Dairen and twenty-nine other stations, occupying 668 acres, as well as huge ground storage yards on the Darien water front and along the line of the railway. The warehouses at Dairen number seventy-three. The freight handled at the warehouses now amounts to about 5,000,000 tons a year, and the number of warehouse receipts exceeds 100,000 a year.

In order to attain uniformity in quantity and weight of bean cake, and also to facilitate its custody, the "mixed storage system" was introduced at the Dairen wharves in 1913 and was later extended to Mukden, Tiehling and Kaiyuan stations on the main line.

The company also inaugurated a plan of insurance, by arrangement with a number of Japanese and foreign insurance companies, whereby it insures goods at the Dairen wharves while in its custody, without charge to the owners.

The Dairen Wharf Office of the South Manchuria Railway looks after the trans-shipment of freight for the benefit of shippers or consignees, putting goods through the Customs Office, obtaining ocean or railway bills of lading, effecting insurance and so forth. This service has proven very useful to those who are not familiar with Far Eastern business practices and have no representative at Dairen.

(3) Harbors and Ships

Dairen, the gateway to Manchuria—Within a few miles of the southernmost point of the Liaotung Peninsula on the Yellow Sea there was less than twenty-five years ago a deserted bay, which the Russians planned to make the southern ocean terminal of the Trans-Siberian Railway. That bay today is one of the finest harbors of the Far East, and ranks next to Shanghai as the second largest trading port on the continental shores of the Pacific.

Dairen, a little while ago a small fishing village on the shore of the bay, has grown into a great modern city of 200,000 people, with boulevards, parks, public buildings, banks, clubs, hotels and business houses planned on the best European models. This wonder city of the Orient is the gateway to Manchuria. On its great docks are annually handled 5,000,000 tons of merchandise, the products of Manchuria's awakened industry exchanging with merchandise from America and Europe and the neighboring countries of the East. This magic transformation has been brought about by the South Manchuria Railway, which has expanded the port and the city as the key to its whole broad plan of Manchurian development.

The construction of the port of Dairen was originally begun by the Russian Government when it obtained a lease of the Liaotung Peninsula from China in 1898. Russia called the site "Dalny" and started construction, but soon after the Russo-Japanese War broke out and operations were suspended. By the Treaty of Portsmouth, the Russian Leased Territory was turned over to Japan. At Dairen, all that Japan found was a half-completed breakwater and one pier.

The South Manchuria Railway immediately entered upon a comprehensive plan of harbor development. The breakwater was improved and completed, and the old Russian pier was reconstructed. Two new piers have since been built, and a third is now under construction. The new breakwater is 14,121 feet long, and the area enclosed by it is 800 acres. Any steamer with a draft not exceeding 30 feet can be berthed at the piers. Fourteen powerful tugboats are at the service of ships entering and leaving the harbor. All piers are equipped with water hydrants capable of furnishing 60 tons of water an hour. There are also two water boats which can supply 30 to 50 tons an hour. The total length of the wharves is more than two and a half miles. Steamers totaling 85,000 tons can be docked at the same time.

Besides these piers, there is one oil pier measuring 1,135 feet in length, just outside the breakwater, for loading and unloading of oil and combustibles, and one junk wharf for the loading and unloading of junk cargoes, which amount to approximately 200,000 tons a year. For vessels discharging or loading in the bay there are twelve steel lighters. There are also three 25-ton and two 50-ton floating cranes at the disposal of merchant ships.

On the piers, and within the wharf compounds, the railway company has built 73 warehouses with a capacity for housing 400,000 tons of cargo, and an area of 315,000 square yards is left available for open storage. Twenty-one electric and steam cranes have been installed on the piers to handle heavy cargo. In the wharf compounds there are 43 miles of railway tracks to facilitate the shifting and handling of merchandise.

One thing which has tended to delay the installation of modern conveying and cargo machinery at Dairen is the low cost of Chinese coolie labor. But American conveying machinery is now being planned for the South Manchuria Railway to be used within the wharf compounds. The present cargo working capacity of Dairen is approximately 37,000 tons per ten-hour day. In addition to this, there is a shifting capacity of 20,000 tons within the wharf compounds. With the installation of modern machinery and equipment, and the expansion of the present facilities, it is planned greatly to increase this capacity. Freight trains are run directly into the wharf compounds and to the piers, to handle through cargo. Passenger trains also run direct to the pier to connect with passenger steamships.

Coaling facilities are also maintained, and steaming coal from the Fushun coal mines is sold for bunkering trans-Pacific steamships calling at Dairen. Facilities are available for loading 3,000 tons of coal in ten hours.

During 1920 an average of eighteen ships, aggregating 41,000 tons, were in the harbor every day. In the same year, 3,530,000 tons of cargo were loaded, and 831,000 tons unloaded; 2,994 steamships, totaling 5,292,000 tons, entered the port. The record number of steamships in port at one time was thirty, and the largest tonnage of steamships in port at one time was 71,800 tons.

The port of Dairen has not only the best equipped harbor in China, but possesses another distinction in that it has the only dry dock in North China. The Kawasaki dry dock in Dairen is 430 feet in length, 50 feet wide, and 25 feet deep. It can accommodate a 6,000-ton steamer.

Other harbors in Manchuria—The harbors of Port Arthur, a short distance below Dairen; Yingkou, at the mouth of the Liao River on the Gulf of Liaotung, and Antung, at the mouth of the Yalu River on the Yellow Sea—also have been improved by dredging and the building of jetties, warehouses and storage yards. But the rise of Dairen as the chief port of Manchuria has overshadowed these other ports. Dairen has great natural advantages over Yingkou and Antung because the harbor is free of ice throughout the winter and the channel is of much greater depth.

Steamships—When the South Manchuria Railway established the new short route from Europe to China and Japan in 1908, the company also put in service a steamship line connecting the Dairen railway terminal with Shanghai across the Yellow Sea. Tsingtao on the China coast was made a port of call. The steamer "Sakaki Maru" (3876 tons, 19 knots) was built at Kobe specially for this service. In connection with Hongkong and Canton shipping interests, the company opened a coastwise shipping line between Dairen and southern China ports, to obtain freight for the railroad. These steamship lines have since been sold to the Dairen Steamship Company to operate.

(4) Coal Mines and Steel Works

Coal mines—The coal mines at Fushun, Yentai and Chatzuyao were taken over in 1907 by the South Manchuria Railway with the railway properties. The Shih-

peling and Taochiatun mines were acquired later in the same year. Of these mines those at Fushun and Yentai have been developed by the railway company. The others have been transferred to private companies to be operated by them.

Fushun coal is a bituminous coal, rich in volatile matter, with a heating power of 7500 calories. Ash and clinkers are very scarce, and sulphur and other objectionable matters are almost non-existent. As fuel for locomotive and marine engines, it competes with the best Japanese coal. Because of the large percentage of volatile matter which it contains it is more suited for gas-making than any other coal in the East. It is also suitable for general industrial uses, for brick and lime kilns, smithies, household uses, etc. Fushun coal does not stick to the grate when it burns, so that even an inexperienced fireman can make a fire with it very easily. It catches fire as soon as it is put into the furnace, facilitating an easy cleaning of fire with little loss of steam pressure. As the quantity of sulphur is infinitesimal, the coal has the advantage of doing very little damage to the boiler plates. It gives out little smoke.

Fushun has been made one of the model colliery towns of the world. For the operation of the mines the most up-to-date methods have been brought from the United States, including the sand-flushing system. There are 82 miles of railway, with 26 electric locomotives and several hundred cars.

With the development of the mining operations at the collieries, the necessity of providing housing accommodation for the employees was recognized, and the company drafted a plan for building a new town at Chienchinchai as an auxiliary enterprise. The management has con-

At Fushun the South Manchuria Railway has erected a modern industrial town, with attractive homes for the employees

Fushun Club at the Fushun Colliery

Auditorium for the entertainment of the workers of the Fushun Colliery

Billiard room in the Yamato Hotel, Dairen

Japanese gardens on the roof of the Yamato Hotel, Dairen

Panorama of Dairen and harbor from Yamato Hotel roof

Bank of Chosen and other modern buildings on Central Circle, Dairen

Roof garden on the Yamato Hotel, Dairen

Central Circle. Dairen, from the Yamato Hotel, showing statue of General Viscount Oshima

Yamato Hotel at Dairen, under the management of the South Manchuria Railway

structed a large number of model residences, as well as streets, bridges, drains and sewers necessary for maintaining a town on modern methods. In addition, a primary school, a colliery hospital, a club, electric and gas works, waterworks, and other public works have been established. At the end of March, 1918, the colliery town contained 5,775 dwellings (3,801 Japanese, 1,666 Chinese, and eight Korean), and the population was 35,980 (10,643 Japanese, 25,283 Chinese, and fifty-four Koreans).

Anshan Steel Works—A description of the Anshan Steel Works is given in Chap. III. The South Manchuria Railway Company has been making every effort to establish the steel works on a firm foundation. During 1921 the company invited a group of American experts and engineers, headed by Dean Appleby of the University of Minnesota, to go to Manchuria and make a complete investigation of the work already done and make recommendations as to the further development of the enterprise. The program for the Anshan Steel Works will be based upon the recommendations of these American experts, who are so well acquainted with the treatment of iron ores in the United States.

(5) Gas and Electricity

Gas works—For lighting, heating and industrial use, the company constructed a gas-making plant in Dairen in 1910. The demand has grown so rapidly that the original plant has been repeatedly enlarged, the capacity having been increased from 280,000 to 1,110,000 cubic feet a day. The output in 1920 was 214,000,000 cubic feet, in the making of which 18,500 tons of Fushun coal were consumed. The by-products consisted of 12,000 tons of coke and 220,000 gallons of tar. In 1920 a large gas tank was erected

at Anshan. The gas system at Fushun markets its surplus in the city.

Electric works—The company maintains electric works at Dairen, Mukden, Changchun and Antung for light, heat and power. The Fushun plant is operated by the colliery. These plants are all equipped with the most modern machinery, and there has been a steady increase in the output of current. Electric railways are operated at Dairen and Fushun. The Dairen system includes suburban lines to Shakakou, where the big railway shops are located, and two seaside resorts, Hoshigaura (Star Beach) and Rokotan.

(6) Hotels

A modern hotel system—In order that European and American travelers in Manchuria might have "all the comforts of home," the South Manchuria Railway planned a system of modern hotels from Dairen to Changchun, which have been built and operated without thought of profit. In addition to building these new hotels, the company has given financial aid to other hotel owners to encourage the operation of high-class establishments along the line of the railway.

The Yamato Hotels—The South Manchuria Railway hotels in the cities of Dairen, Port Arthur, Mukden and Changchun, and at Hoshigaura (Star Beach) are known as the Yamato Hotels.

The chief of these is the famous Dairen Yamato Hotel, a fireproof structure in modern Renaissance style, with all the conveniences the experienced traveler is accustomed to in the best foreign hotels. It faces the central plaza of the modern city of Dairen, and the Japanese roof garden overlooks the busy harbor.

Five miles southwest of Dairen at beautiful Hoshigaura on the sea, have been built a summer hotel and a number of bungalows and villas in European and Japanese style which are let furnished. Here tennis, golf, boating and other sports attract the visitor. The golf course has been laid out over the hills back of the hotel.

(7) Scientific Research Institutions

Putting science at work in Manchuria—For the purpose of giving Manchurian industry the benefit of the world's scientific knowledge, and at the same time promoting independent research in applied science, the South Manchuria Railway has organized three major research institutions: the Central Laboratory at Dairen, the Geological Institute at Dairen, and the Agricultural Experiment Station at Kungchuling, with branches at other points. These institutions have brought to Manchuria the results of scientific research in Europe and America, and have been of inestimable value in developing the resources of the country. In these institutions young men educated in foreign universities and technical schools are encouraged to make new discoveries, invent new processes, find new uses for materials, and teach the native tillers of the soil how to "make two blades of grass grow where one (or none) grew before."

The Dairen Central Laboratory—The Central Laboratory, originally established by the Kwantung Government in 1908, was taken over by the railway two years later. The work was reorganized into eight divisions: analytical chemistry, applied chemistry, tussah filature and dyeing and weaving, pottery, brewing, sanitation, electrical chemistry and general.

It was provided that for any enterprise promising to be commercially profitable an experimental factory might be

set up, and that when any experimental factory reached the commercial production stage it should be turned over to a business company to operate. A tussah filature was established in 1910, followed by an earthenware and porcelain factory, and a fire brick kiln. Later a sorghum alcohol distillery, a dyeing and weaving works, a bean mill employing chemical extraction, and a fatty acid factory were organized. Still later there was added a glass factory and a lignoid factory.

The experimental bean mill, with its fatty acid factory, was transferred to private management in 1915, upon the completion of the series of experiments for which it had been established. The textile and dyeing works was reorganized into a textile division in 1917, the works having been transferred to private management. The lignoid factory, having finished the experiments originally planned, was also transferred to private management. In 1920 the pottery industry division was detached and was formed into a Ceramic Experimental Institute. The other divisions were incorporated into the two new divisions of examination and research. The distillery and the filature were both shut down, as they had finished the experiments laid out for them. Among the industries built upon the results of investigations by the laboratory may be enumerated the manufacture of hardened oil, salvarsan, calcium lactate, potassium salts, starch, improved *koji* for sorghum alcohol, rice, yeast, and permutite filter.

Geological Bureau—The Geological Bureau was first established at Fushun to help develop the Fushun Coal Mines. Later the office was removed to Dairen and devoted to geological work and a survey of the mineral resources of Manchuria. The conspicuous achievements of the bureau have been the discovery of the iron deposits of Anshan and seven other localities, the discovery of mag-

nesite in the Kaiping and Haichung districts, the discovery of fluorspar, and surveys of the coal fields.

Agricultural Experiment Stations—The Agricultural Experiment Stations and farms occupy 750 acres. The main station was established in 1913 at Kungchuling, and a branch at Hsiungyocheng in 1914. Nurseries were later started at various points along the railway line. A description of the important work done by these stations is given in Chap. II, in the sections on agriculture and forestry.

Farm improvement work—The railway, in connection with the Agricultural Experiment Stations and other departments, encourages the native farmers in various ways. It distributes fertilizers and shows how to use them; reclaims land, builds drains and ditches, digs wells and supplies water free of charge, distributes seeds, protects domestic animals from disease, introduces blooded stock, gives financial assistance, and carries fertilizers and other necessities at reduced freight rates.

Eastern Asia Economic Research Bureau—This bureau was established in 1908 in Tokyo for general economic research work and the study of international business and financial conditions. The work is modelled after that done in Europe and America by banking and industrial corporations and in this work are engaged a number of Japanese and foreign experts. This bureau has published more than two hundred reports.

Other research work—Other bureaus established by the South Manchuria Railway are making researches into Manchurian and Korean history and Manchurian and Siberian customs. The former work is under the direction of Dr. Shiratori, the authority on Oriental history in the Japanese Imperial University. The study of ancient cus-

toms has resulted in the publication of a number of monographs.

(8) Civic Administration

The development of the railway area—By the Portsmouth Treaty, signed at the close of the Japanese-Russian War, a part of Manchuria passed under Japanese administration. That portion of the South Manchuria Railway south of Changchun, and the territory which had been leased by China to Russia, were transferred to Japan. The Japanese set up the Kwangtung Government for the administration of the Leased Territory, and the policing of the South Manchuria Railway Zone. For the economic development of the Kwangtung Peninsula, the Japanese Government depends largely upon the policies worked out by the South Manchuria Railway Company.

The Leased Territory has an area, including islands, of a little over 1,300 square miles, or about as large as a good-sized county in the eastern United States. About 225,000 acres of this land are under cultivation. The population of the Leased Territory, according to the census taken in 1921, was 665,619. This population comprised 587,320 Chinese, 77,490 Japanese and 809 of other nationalities.

For local government purposes the Leased Territory is divided into three civil administration districts. The railway company assumes the obligation of providing the zone with the necessary schools, hospitals, waterworks, roads, streets and sewers.

The great increase in population has been due to Chinese immigration resulting from the development of the resources of the country by the Japanese.

The increase in population in the railway zone during

the recent years has been as follows:

	Chinese	Japanese
1908	12,375	17,142
1912	33,435	30,436
1916	59,985	40,158
1920	103,043	71,643

For all Manchuria the following are approximate figures of the growth in population:

	Chinese	Japanese
1912	20,252,300	81,761
1916	24,993,000	97,066
1920	27,120,900	167,889

Land and buildings—The Railway Zone, a narrow strip of land along the right of way, has a total area of 64,000 acres. There were 5,000 buildings occupying 180 acres within the Railway Zone in 1907. The buildings now number 12,500. This includes all the official buildings of the company, commercial buildings and all other buildings controlled by the company. The total land holdings of the company are 614,000 acres.

The company does not monopolize the land or buildings, but leases them to individual residents for the purpose of developing Manchuria. In the cities a permit is refused for any building that tends to create congestion and unsanitary conditions.

The building up of cities and their proper management is an important item of the company's improvement work. Seven hundred miles of the railway line afford many locations adapted for city building, especially where the company's stations are located. At the time when the company started its work there were no modern cities along its lines, except Port Arthur, Liaoyang and Kungchuling. All the rest were simply groups of buildings, in the Russian style, scattered at wide intervals. The roads

were not properly constructed, nor kept in repair, and were without drainage. In dry weather the dust covered everything in sight, and during the rains the roads became impassable. The railway company early decided to build modern cities at important points. Fifteen locations were selected, and modern plans drawn. The new cities from Dairen northward are the result of this plan.

Railway zone policing—In the interior of China, peace and order are maintained by the army and the police. But the northern provinces are infested with armed bandits. The railway zone itself has been often attacked since 1907. The Kwantung Government, therefore, maintains a sufficient police force and railway guard to protect the narrow strip of railway, make safe the running of its trains, prevent the destruction of railway property and the cutting of telephone and telegraph wires, and also protect the residents and their properties within the zone.

Hospitals, sanitation and hygiene—When the South Manchuria Railway Company was organized there was a central military hospital in Dairen, and branch hospitals and medical stations in nine other cities in Manchuria. These were taken over by the railway, extended, popularized and modernized.

After the acquisition of the hospitals, special efforts were made to expedite the completion of the entire system, with the result that there are fifteen hospitals today, situated at Dairen, Liaoyang, Mukden, Tiehling, Kaiyuan, Kungchuling, Changchun, Penhsihu, Antung, Yingkou, Fushun, Wafangtien, Anshan, Ssupingkai and Kirin. In addition there are six branch hospitals, some situated in the old Chinese towns, and two medical consultation stations at the Fushun and Yentai Collieries.

The Hospital at Dairen has been made a model institu-

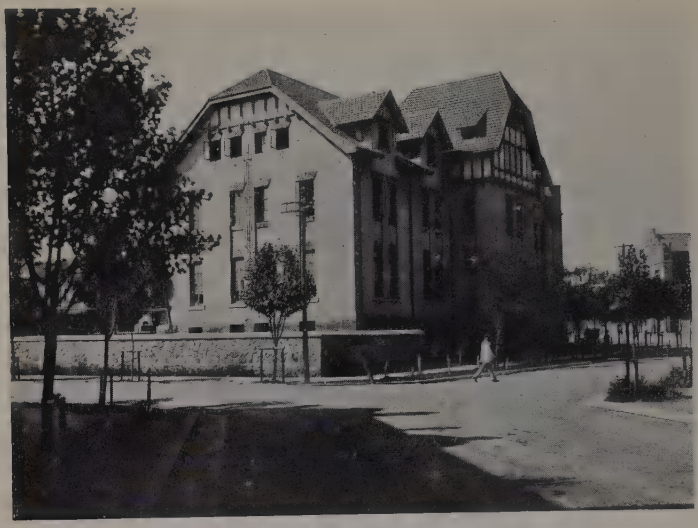
Chemical laboratory in the Industrial School, Dairen

In the Central Laboratory, Dairen

Dissection room in the Mukden Medical College, founded by the South Manchuria Railway

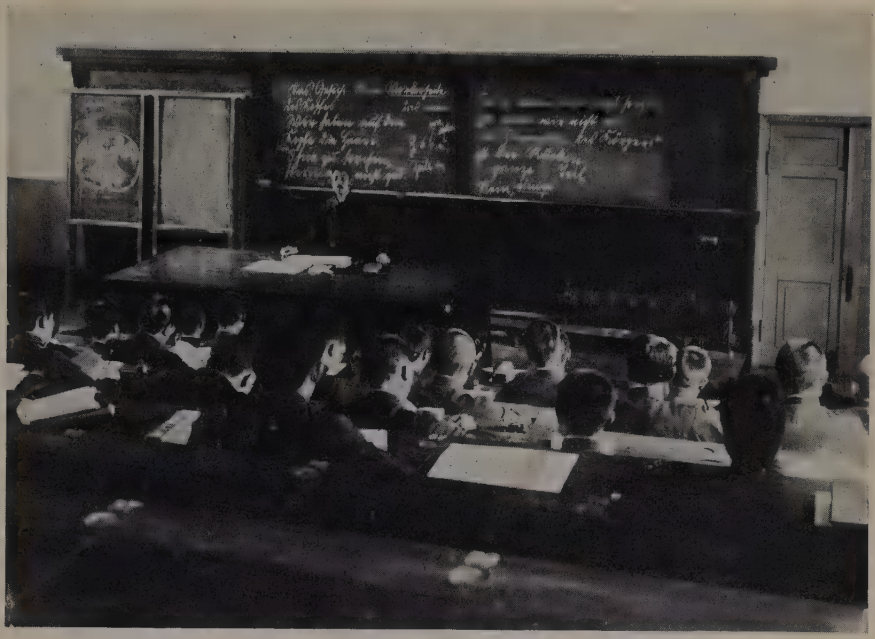
Experimental laboratory in the hospital at Mukden

Ceramic Experimental Institute, Dairen



Young Men's Christian Association, Dairen

The relief crew at the Fushun Colliery, ready to go down into the pits in case of emergency



Lecture hall in the Medical College, Mukden

Elementary school at Fushun for the children of employees and others

The Public Library, Dairen

the South Manchuria Railway Company

tion, comprising nine scientific departments. Beside the 450 regular patients which this hospital can take care of, there is a clinic for outside patients with an average daily attendance of more than 800 people. Beside this, there is a medical college, established in 1911 at Mukden, where doctors for these hospitals and medical stations are trained.

The Japanese Red Cross also maintains thirteen hospitals throughout Manchuria and Mongolia and some of these are situated where they may benefit most the poorer and more illiterate class of Chinese; and in Dairen and Port Arthur there are special hospitals for contagious diseases and for women patients.

In most of these institutions a scientific course in nursing is given and in some a school of pharmacy is also conducted for the benefit of those seeking such knowledge. These hospitals are open to everybody in Manchuria and thousands of people who never before were reached by science flock to their doors.

In addition to the two hospitals, the company maintains public physicians, who, while practising on their own account, have been appointed by the company to guard against the outbreak and spread of infectious diseases, to make investigations of epidemics, etc., in the interest of public health and to spread, as much as they can, the knowledge of hygiene and sanitation throughout the districts where so many of the natives have never before realized the necessity for even cleanliness. Such competent medical men are scattered throughout the Leased Territory, in the big cities, in the old Chinese towns, and outside of the railway area they administer medical relief.

Nothing is being left undone toward safeguarding public health in the Kwantung Peninsula. The public health department has charge of the yearly vaccination of the

inhabitants, which is given without cost. The record in health, resulting from vaccination, is improving every year.

Epidemic diseases have been a difficult problem. Working together to hold epidemics and plagues in check, the Chinese and Kwantung Governments, the hospitals, medical stations and doctors under the control of the railway, and the Quarantine Bureau, have all worked in the utmost harmony to check such epidemics and to protect the people of Manchuria from their ravages. The Quarantine Bureau has been particularly effective in its work in the ports and along the waterfront, transferring any infected people to hospitals or keeping them in quarantine. All of these organizations are endeavoring to wage a warfare on the Manchurian flies, and thus to exterminate that method of disease communication.

The Kwantung Government also inspects drinking water throughout the district. The South Manchuria Railway Company, through its inspectors from the Central Laboratory at Dairen, inspects the water along the railroad line once a month, and all well water throughout the Railway Zone is examined twice a year. It also inspects all meat.

All the schools have assigned to them school physicians, and there are visiting oculists, dentists and nose and throat specialists who also guard the health of the school children of Manchuria. This system of inspection, advice and treatment is carried into the railway works, factories and mines.

Education—In 1907 there were but two elementary schools, one for Japanese children at Liaoyang under the Y. M. C. A. and one for Chinese children at Chenkingsai established by the Buddhist Mission. Today the South

Manchuria Railway Company maintains twenty-five elementary schools for Japanese and thirteen for Chinese children; eleven girls' schools for practical courses; one girls' high school; three commercial schools each for Japanese and Chinese boys; two high schools; an industrial college; a school of elementary mining; a medical college; and twenty kindergartens and play-grounds. In addition to these schools there are two libraries and nineteen branch libraries and other educational institutions.

There is no discrimination shown in these schools between the Chinese and Japanese scholars, although divisions of schools and classes are frequently necessary, owing to the difference in language.

Elementary education, to reach all classes and spread its civilizing power over a country, must be compulsory. But to force such education on the Chinese, steeped in centuries of their own traditions, was not an easy problem.

The South Manchuria Railway Company has followed a policy of making education so attractive that people would practically beg for it. There is an average of one elementary school for the Japanese children in every thirty miles of the company's main line, and one in every forty miles of the Mukden-Antung Line. The company provides passes on the railroad for the school children and regulates the time schedule in order that trains may stop at places where there are schools outside of regular station areas. By these special arrangements and by the establishment of dormitories in different schools, there are hardly any children who cannot attend school. Among the twenty-five elementary schools, twenty have already added the grammar grades. There are now in these schools 94,000 children and 263 teachers. Elementary schools for the Chinese children maintained by the rail-

road company are divided into three groups: those located in the thickly populated districts in the railway zone or just outside of it; those in the important cities along the railroad, where advanced classes are carried on and boarding house arrangements are available; and those schools where the Chinese language is taught to the Japanese. This study of the Chinese language is encouraged and Chinese is taught not only in elementary schools, but in all of the vocational schools.

The high schools are crowded with earnest students. The Mukden high school, first established in 1919, is growing in popularity among the young residents of the old Manchurian capital. It admits graduates of the Chinese grammar schools and has preparatory courses for the South Manchuria Medical College.

Two commercial schools, one at Changchun and the other at Yingkou, are educating both Japanese and Chinese pupils in business principles. Connected with these schools is the Fushun Elementary Mining School. In all of these schools, from primary to college, physical development and sports of all kinds are encouraged.

As soon as the educational institutions for Chinese children were established in 1911, the railway company sent three teachers to Peking and Mukden for a period of two years, to make them more familiar with the customs and manners of the Chinese. Since that time two teachers are sent every year to Peking. In 1913 the teachers' training school was established; its name was changed in 1915 to the Educational Research Institution.

The South Manchuria Medical College in Mukden has a two-fold mission in Manchuria—first, to supplement the general plan for bringing sanitation and health into Manchuria and Mongolia, and, second, to afford both Chinese

and Japanese youth the opportunities of a modern education in medicine and surgery. At first no tuition was charged, but now a nominal fee is charged the Japanese students, and many scholarships are awarded each year so that all ambitious youths may have an opportunity to take the course. All students are required to live in the college dormitories. The college has now enrolled 66 Chinese and 101 Japanese students. The railway company has already spent over $750,000 on this institution. The Chinese Provincial Governor of Manchuria is honorary president of the school.

Religious education is carried on in a great measure by many of the Christian denominations who have taken an active interest in the school program of the railway company. Sunday schools and kindergartens are numerous. Japanese Christian institutions in Manchuria and the neighboring districts are increasing in number.

Playgrounds and play-buildings have been established. There are now twenty playgrounds with a registration of more than one thousand children and more than fifty nurses. Besides these, there are six private institutions to which the railway company is giving financial aid.

The railway company has established public libraries at Dairen and Mukden. Branch libraries are found in all the important cities. These branch libraries not only have their permanent collections, but receive circulating libraries. In addition there are 210 receiving stations where people at a distance from the libraries receive cases of books. All passenger trains of the South Manchuria Railway Company are provided with small libraries.

VI. THE OPEN ROAD IN MANCHURIA

Manchuria, long the Forbidden Provinces of China, is now open to the traveler. Beauties of scenery, as wonderful as anywhere in Asia, lure the European and American to this far country. Not only is Manchuria the scene of amazing developments, new cities, modern industries, scientific achievements and vast agricultural areas, but there is in this old Land of the Manchus a wealth of unforgettable beauty. The cities have a two-fold charm. Adjoining the principal age-old Chinese towns there have arisen modern cities, thus providing the traveler not only with the delights of ancient Oriental life and scenes but making it possible to live while there as he would live at home.

Dairen, on the Yellow Sea, the wonderful new city of Manchuria, has been described in earlier chapters. Changchun, at the northern terminus of the railway, has been called the melting pot of Manchuria, and through its streets still drive the old Russian droshkies, mingling with the spike-wheeled Peking carts, the dainty 'rickshas of Japan and the latest models of Western motor cars.

Mukden, about midway between Dairen and Changchun, is the greatest point of historical interest in Manchuria. This is the old capital of China. Within the massive walls of the ancient city the natives live today as they have lived for hundreds of years. The teeming streets give a vista of shops, gateways, Chinese theatres, drum towers, temples and palaces. Beyond the walls, in the surrounding forests, stand the historic and magnificent tombs of the Manchu Emperors.

Numerous other cities, each with its special claim to the traveler's interest, are reached by the South Manchuria Railway. Manchuria

is not all cities, nor all prairies, nor all soya bean fields. Mountains with foaming rivers, ancient temples and fairy-like groves form a background for historic hot springs famous for their curative waters. Along the Yellow Sea charming seaside resorts, unrivalled in the Orient, are known to all Western residents in the Orient and are now beckoning to the tourist passing through the East.

Hoshigaura, or Star Beach, is a seaside resort twenty minutes by motor from Dairen. A modern summer hotel and picturesque bungalows attract many visitors who enjoy the excellent bathing, tennis and golf of this charming spot.

Ogondai (Port Arthur) is a beautiful beach resort, with pine-clad hills, an historic battlefield, cozy bungalows and a comfortable hotel. An old fishing village adds interest, and little tea houses perched on the cliffs enchant the eye.

The Hot Springs at Hsiungyocheng are of great medicinal value. Excellent hotel accommodations are offered to the traveler who takes the cure at this beautiful resort.

At Chienshan, or "The Thousand Ridges", among the beautiful peaks of the mountain range south of Mukden, cluster Buddhist and Taoist temples where the traveler may find hospitality and enchantment while visiting at the Hot Springs. The green ridges of Chienshan are broken with cataracts and traced with alluring roads over which the sedan chairs of tourists are borne swiftly by coolies. A day or a night spent at any of these temples is a page out of China's mystic and gorgeous history.

The historic springs of Tangkangtzu, near Anshan, close to the Chienshan mountains, are healing hot springs of great curative value. Known in ancient times, the waters have been greatly developed, and a beautiful Japanese style hotel with American improvements welcomes the visitor.

Wu-lung-pei, called the beautiful spa, is in a mountain valley near Antung. These historic springs have been modernly developed, and scientifically tested and found excellent for cases of rheumatism. A modern and comfortable hotel is part of the attraction.

Manchuria, with its modern railway system, is now easy of access from Japan and other parts of China. World travelers now include it in their Oriental tours.

In going from Japan to China proper, a visit to Manchuria necessitates but a short and very worth-while detour, and in making this detour an adequate view of Chosen (Korea) is afforded the traveler. From the old Manchu capital, Mukden, south to Tientsin, Peking,

Nanking, and other cities, the Peking-Mukden Line, and the Peking-Pukow Line (Chinese Government Railways) offer excellent transportation. From Peking, the Peking-Hankow Line and the Shanghai-Nanking Line connect with Hankow and Shanghai, and the Peking-Suiynan Line runs to Suiynan and the world-famous great wall. From Dairen, there are delightful sea-trips to Shanghai, Tsingtao, and Hong Kong. From Changchun, the Chinese Eastern Railway (which forms a part of the Trans-Siberian Route) takes the traveler north to such points as Harbin, and from there either to Vladivostok on the east, or to Manchouli on the west.

The Chosen Railway which takes the traveler from Antung, Manchuria, through Chosen, straight through to Fusan on the Korean Straits, is under the direction of the South Manchuria Railway Company. From Fusan a ferry-steamer brings the tourist to Shimonoseki in Japan, and from there, via the Japanese Government Railways, one may reach any part of Japan—Nagasaki on the south, (where a steamship line connects with Shanghai and Hong Kong); or northward to Tokio and Yokohama—the great Japanese port of the trans-Pacific lines.

Lama Tower, Liaoyang, over a thousand years old

(c) Newman

The Pei-ling tombs at Mukden

Chinese Temple in the Chienshan Mountains of Manchuria

Verandah restaurant, Hoshigaura

A honeymoon cottage in true Japanese style at Hoshigaura

"Driving off" on the golf links at Hoshigaura (Star Beach) near Dairen

Entrance to the great northern Mausoleum of the Manchu Emperors

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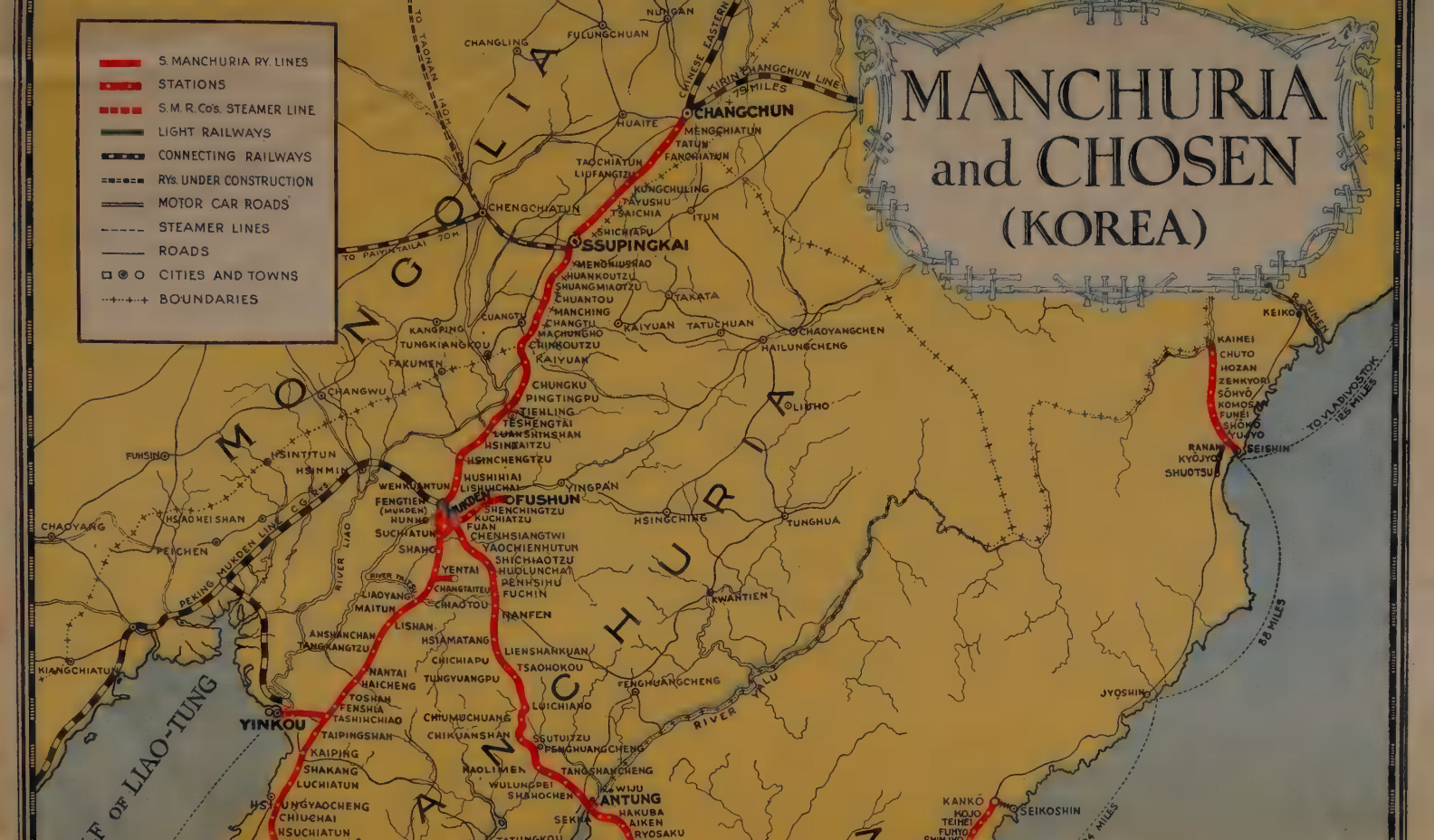
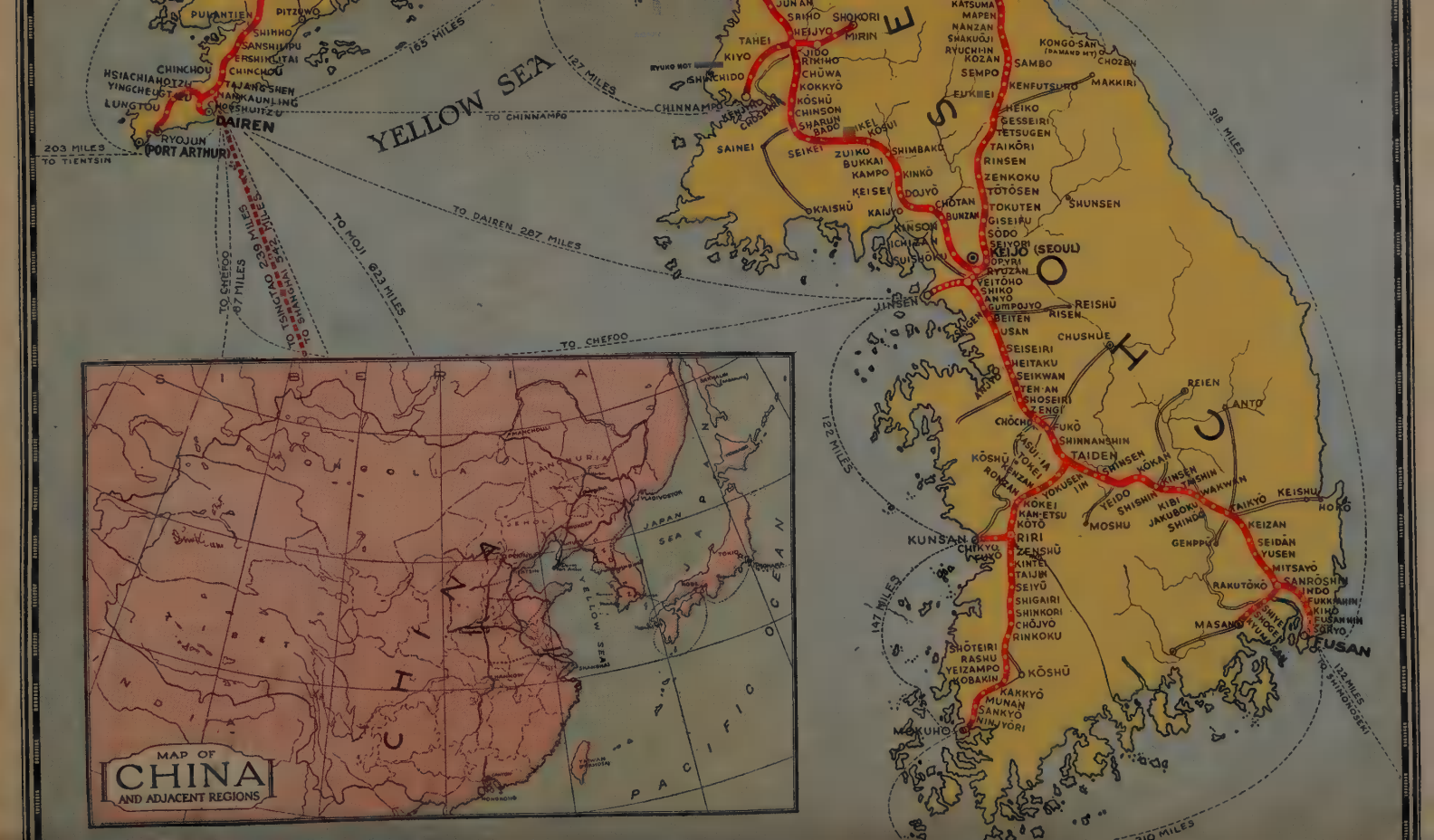

MANCHURIA
and CHOSEN
(KOREA)
S. MANCHURIA RY. LINES
STATIONS
S.M.R. Co's. STEAMER LINE
LIGHT RAILWAYS
CONNECTING RAILWAYS
RYS. UNDER CONSTRUCTION
MOTOR CAR ROADS
STEAMER LINES
ROADS
CITIES AND TOWNS
BOUNDARIES
MONGOLIA
MANCHURIA
CHANGCHUN
SSUPINGKAI
FUSHUN
MUKDEN
YINKOU
ANTUNG
KEIKO
SEISHIN
JYOSHIN
SEIKOSHIN
KAINEI
CHUTO
HOZAN
ZENKYORI
SOHYO
KOMOSAN
FUNEI
SHOKO
YUGYO
RANAN
KYOJYO
SHUOTSUO
KANKO
MOJO
TEIHEI
FUHYO
SHINKO
NUNGAN
FULUNGCHUAN
CHANGLING
KIRIN-CHANGCHUN LINE
79 MILES
HUAITE
MENGCHIATUN
TATUN
FANCHIATUN
TAOCHIATUN
LIUFANGTZU
KUNGCHULING
TAYUSHU
TSAICHIA
ITUN
SHICHIAPU
CHENGCHIATUN
TO TAOHAN
TO PAIYINTAILAI
MENCHIUSHAO
HUANKOUTZU
SHUANGMIAOTZU
CHUANTOU
MANCHING
TAKATA
CHANGTU
MACHUNGHO
CHINKOUTZU
KAIYUAN
TATUCHUAN
CHAOYANGCHEN
HAILUNGCHENG
KANGPING
CUANGTU
TUNGKIANGKOU
FAKUMEN
CHANGWU
CHUNGKU
PINGTINGPU
TIENLING
TESHENGTAI
LUANSHINSHAN
HSINCHAITZU
HSINCHENGTZU
HUSHIHIAI
LISHUCHAI
WENKUANTUN
FENGTIEN
(MUKDEN)
HUNHO
SHENCHINGTZU
KUCHIATZU
FUAN
CHENHSIANGTWI
YAOCHIENHUTUN
SHICHIAOTZU
HUDLUNCHAI
PENHSIHU
FUCHIN
NANFEN
YINGPAN
HSINGCHING
TUNGHUA
LIUTHO
FUSHIN
HSINTITUN
HSINMIN
CHAOYANG
HSIAOHEISHAN
PEICHEN
SUCHIATUN
SHAHO
YENTAI
CHANGTAITEU
LIAOYANG
MAITUN
CHAOTOU
LISHAN
HSIAMATANG
CHICHIAPU
TUNGYUANGPU
LIENSHANKUAN
TSAOHOKOU
FENGHUANGCHENG
KWANTIEN
ANSHANCHAN
TANGKANGTZU
NANTAI
HAICHENG
TOSHAN
FENSHUA
TASHICHIAO
KIANGCHIATUN
CHIUMUCHUANG
CHIKUANSHAN
LUICHIANO
SGUTUITZU
PENGHUANGCHENG
TANGSHANCHENG
WIJU
HAKUBA
AIKEN
RYOSAKU
SEKKA
KAIPING
SHAKANG
LUCHIATUN
TAIPINGSHAN
HSUCHIATUN
HSUNGYAOCHENG
CHIUCHAI
MAOLIMEN
WULUNGPEI
SHAHOCHEN
RIVER LIAO
RIVER YALU
MUKDEN LINE
PEKING
GULF OF LIAO-TUNG
TO VLADIVOSTOK
125 MILES
88 MILES


YELLOW SEA
PUKANTIEN
PITZUWO
SHIHHO
SANSHILIPU
ERSHILIUTAI
CHINCHOU
HSIACHIAHOTZU
YINGCHEUGTZU
LUNGTOU
TAJANGSHEN
HOFSHUITZU
DAIREN
RYOJUN (PORT ARTHUR)
203 MILES TO TIENTSIN
165 MILES
127 MILES
TO CHINNAMPO
TO DAIREN 287 MILES
TO MOJI 623 MILES
TO CHEFOO
239 MILES
TO SHANHAIKWAN
TO CHEFOO
67 MILES
JUNAN
SAIHO
SHOKORI
HEIJYO
MIRIN
TAHEI
KIYO
RYUKO HOT
SHICHIDO
CHINNAMPO
JIDO
RIMIHO
CHUWA
KOKKYO
KOSHU
CHINSON
SHARUN
BADO
SAINEI
SEIKEI
NIKEI
KOSUI
ZUIKO
BUKKAI
KAMPO
KEISEI
KAISHU
KAIJYO
SHIMBAKO
KINKO
TOJOYO
CHOTAN
BUNZAN
SINSON
ICHIZAN
SUISHOKU
KATSUMA
MAPEN
NANZAN
SHAKUOJI
RYUCHIN
KOZAN
SEMPO
EUKEI
SAMBO
KONGO-SAN (DIAMOND MT.)
CHOZEN
MAKKIRI
KENFUTSURO
HEIKO
GESSEIRI
TETSUGEN
TAIKORI
RINSEN
ZENKOKU
TOTOSEN
TOKUTEN
GISEIRU
SODO
SEIYORI
KEIJO (SEOUL)
OPYRI
RYUZAN
YEITOHO
SHIKO
ANYO
SUMPOJYO
BEITEN
USAN
SEISEIRI
HEITAKU
SEIKWAN
TEN-AN
SHOSEIRI
ZENGI
CHOCHO
SHUNSEN
REISHU
RISEN
CHUSHUE
ANTO
REIEN
FUKO
SHINNANSHIN
TAIDEN
SHINSEN
KOKAN
KASUI-JA
TOKEI
RONZAN
KOSHU
TOKUSEN
JIN
YEIDO
SWISHIN
KIBI
JAKUBOKU
SHINDO
WAKWAN
TASHIN
KAIKYO
KEISHU
HOKO
MOSHU
KEIZAN
GENPPO
SEIDAN
YUSEN
MITSAYO
SANROSHIN
NDO
FUKKAHIN
KIHO
SUSANNIN
GORYO
RAKUTOKO
MASAN
CHINHAE
KUNSAN
CHIKYO
KOKEI
KAN-ETSU
KOTO
RIRI
ZENSHU
KINTEI
TAIJIN
SEIYU
SHIGAIRI
SHINKORI
CHOJYO
RINKOKU
SHOTEIRI
RASHU
YEIZAMPO
HOBAKIN
KOSHU
KAKKYO
MUNAN
SANKYO
YINYORI
MOKUHO
122 MILES
147 MILES
318 MILES
123 MILES TO SHIMONOSEKI
TO FUSAN
MAP OF CHINA AND ADJACENT REGIONS
SIBERIA
MONGOLIA
MANCHURIA
CHOSEN
JAPAN SEA
TOKYO
NAGASAKI
YELLOW SEA
PACIFIC OCEAN
TIBET
INDIA
CHINA

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Manchuria Land

Apportion